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ABSTRACT

Findings are reported from 25 sites using the Individualized Study by Telecommunications (IST) program, an individualized, multi-media approach involving microcomputers which was designed to bring secondary education to small, isolated rural school districts in Alaska. This document summarizes the development and pilot-testing of the model, courseware (Alaska history, English, general math, and developmental reading), and procedures which were used in the project. In Part I, an introduction briefly explains the program, evaluation design, theoretical approach, and basis for the evaluation, and lists the 27 specific questions used to cover five broad areas--students, teachers, settings, courses, and costs. Four illustrative site visit reports are included to provide a context for the results. Part II summarizes the general and specific evaluation findings, and provides specific and general recommendations. Ten references are listed, and appendices contain study data tables, as well as the eight second site visit instruments with responses recorded, which provide information on school characteristics and course implementation, hardware and software, teacher and student classroom behavior, characteristics of IST communities, students' attitudes toward self, school and IST courses, student characteristics, and teachers' attitudes toward the courses. (LMM)

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FINAL REPORT

EVALUATION OF IST COURSES

FY81 PILOT STUDY

PART I

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INTRODUCTION

The IST Program

The IST Program (Individualized Study by Telecommunications) was designed to bring secondary education to small isolated rural school districts in Alaska. The development and pilot-testing of the model, courseware, and procedures constitutes a multi-year effort of the Alaska Department of Education's (DOE) Educational Telecommunications for Alaska Project. During the 1979-80 school year, two courses, Alaska History and English, developed by the Northwest Regional Educational Laboratory (NWREL) in Portland, Oregon were pilot-tested in seven rural sites. Two more courses were added in the 1980-81 academic year, General Math and Developmental Reading. The four courses were further pilot-tested in 29 sites during FY81. The present evaluation report focuses on the results from the 25 sites which provided sufficient data for the evaluation.

The IST Program was particularly necessary because the rural schools of the state are often so small and isolated that providing complete resources and teaching staff for so few children was impractical. For example, a school with only 60 to 70 students in a K-12 program, might only have 12 to 15 students at the secondary level. To offer secondary programs for these students in the traditional way would require teachers for science subjects, mathematics, English, social studies, etc.. To reduce the cost, and at the same time provide quality secondary level educational programs, the IST courses were designed to use a variety of instructional components and educational media and technology. These components include CMI/CAI (Computer-Managed Instruction/Computer-Assisted

Instruction), audio cassette tapes, workbooks, supplementary materials, texts, and planned student projects.

At least one teacher at each participating school was designated the IST supervising teacher, and was trained in use of the Apple II computer and the course materials by DOE. It was not required that these teachers have certification in the four course areas being pilot-tested, or prior experience with computers or other forms of educational technology.

The Evaluation Design

The evaluation of IST was seen as involving a complex pattern of interlocking relationships between courseware, cultural values, social and environmental contexts, local facilities, community perspectives, students' characteristics, teachers' attitudes, and so on. Further, the mission of the evaluation was considered to be more than to simply determine whether IST "worked", but also to provide explanations for the degree of effectiveness achieved by the program, and recommendations for changing or improving the approach, and/or the materials. For this reason, the evaluation design was based on a causal attribution theory approach (Weiner, 1972), with considerable attention to school and cultural influences (i.e., Kleinfeld, 1974).

The Theoretical Approach

In recent years a number of researchers have been investigating the role of cognition, particularly causal attributions, as a variable influencing achievement motivation (Bar-Tal, 1978). Attribution theory (Weiner, 1972) based on the ideas of Heider, (1958) and research involving Rotter's concept of locus of control assumes that ability, effort, task difficulty, and luck are main

causal factors used in explaining success and failure. Each of these factors can be classified along the dimensions of locus of control and stability.

It had been generally assumed that an individual's beliefs about the causes of his or her success or failure mediate between the perception of an achievement task and one's performance. For example, if a person ascribes success on an achievement task to his or her ability (an internal-stable cause) an increased sense of pride (affective reaction) and expectations for future success (cognitive reaction) is produced. Indeed, Weiner et. al. (1971) postulated that future expectations for success were largely a function of internally determined factors, particularly effort. Covington and Omelich (1979) have argued that ability attributions are the most important determinant for the expectations of achievement.

While causal ascriptions seem to be reducible to a small number of dimensions, researchers have found a large number of perceived causes of achievement events (Cooper & Burger, 1978; Rosenbaum, 1972; Weiner, 1979). Preparation, the teacher, the instructional materials, interests, home situation, the type of test being used, and one's ability are among the causes of achievement identified by previous research. The present evaluation, therefore, attempted to investigate as many influences as possible which may operate on the student in IST classrooms that might affect achievement.

This model can be viewed as accounting for achievement motivation, and also showing how the combination of students' feelings towards themselves, and their teachers' feelings towards them can influence

achievement. For example, Kleinfeld's (1974) "sentimentalist teacher" makes no demands on a failing student and such sympathy could exacerbate feelings of incompetence (Weiner, 1980). Another example might be the "traditionalist teacher" (Kleinfeld, 1974), who is likely to respond with anger and withhold assistance from low-effort students. Such an insensitive and impersonal orientation could encourage lack of effort in these students and exacerbate their feelings of guilt about their low achievement level (Weiner, 1980).

These examples may help to illustrate the antecedents of poor motivational patterns in students who attend rural village schools in Alaska. While not all such schools are taught by teachers who conform to Kleinfeld's typology or use inappropriate teaching techniques, lack of resources or skill in necessary secondary school subjects can contribute to lowered motivation of students and reduction in exposure to subject matter. An individualized instructional model like IST could reduce any negative effects of conflicts between teaching style and students' achievement attributions. Further, because IST is self-pacing and student-directed, it could result in a greater sense of effectiveness, mastery, and competence.

The Basis for the Evaluation

The evaluation was designed to determine how the student, teacher, courses, and setting combine to influence student performance. In addition, there were concerns about the costs of the IST program as it was implemented in the FY81 pilot study. Three general questions had been identified by DOE for the evaluation:

1. What can be done to assist in the successful implementation of IST?
2. What can be done to improve IST for next year?
3. Generally, how successful is the IST program, and what level of state support for this program is desirable for next year?

On the basis of these questions and the theoretical approach described in the last section, 27 specific questions were developed for the evaluation to address. Each question was considered in several ways by identifying potential information sources. The potential sources for information to be used to answer the evaluation questions is shown in Figure I. Notice that most questions had several potential sources in order to develop more complete perspectives.

Specific Questions for IST Evaluation

The IST evaluation is basically designed to answer three questions. These are:

1. What can be done to assist in the successful implementation of IST?
2. What can be done to improve IST for the next year?
3. Generally, how successful is the IST program, and what level of state support for this program is desirable for next year?

In this context, questions have been devised for the IST evaluation which cover five broad areas: the student, the teacher, the settings, the courses, and the costs. The specific questions for the evaluation are identified below under these five broad categories.

I. The Student

1. What are the students' entry levels and skills?
2. What characteristics of the student population contribute most and least to performance on IST?
3. What are the students' attitudes towards school and self?
4. Who are the students who take IST courses (in terms of demographic variables)?
5. What is the relationship between attendance rates and IST performance?
6. Is there a typical pattern of performance through the IST lessons?

II. The Teacher

1. What are the teachers' attitudes toward IST?

2. Is the pre-service training and other instruction available for teachers enough for supervising teachers at the sites to operationalize the IST, and is additional supervision required?
3. How much supervision must supervising teachers provide to students?
4. What are the characteristics of the supervising teachers and which of these contributes most to their success?

III. The Setting

1. What are the characteristics of the IST sites?
2. What kind of space and how much space does IST require in a school?
3. What is the typical teacher-student ratio for IST and conventional courses?
4. Which sites do better on each component of IST programs and why?

IV. The Courses

1. What are the most effective and least effective components and courses in IST?
2. Do the components and units in IST courses mesh well into integrated courses?
3. Are reading levels of the IST materials appropriate?
4. Are cognitive levels of IST materials and tests appropriate for the target population?
5. How is progress in IST reported, and credited in the students' records?
6. Are media options being used effectively and appropriately, and can media use be expanded?

7. What is the instructional design for IST?

8. Can performance on computer exercises be predicted from available data?

9. What revisions in CAI are necessary?

10. Are the diagnostics prior to the course effective?

V. <u>The Costs</u>

1. What are the per-student costs of IST and its components?

2. How does the per-student costs of IST compare to conventional courses?

3. What are the costs for training teachers?

INFORMATION SOURCES AND IST EVALUATION QUESTIONS

INFORMATION SOURCES	EVALUATION QUESTIONS																									
	I. STUDENT						II. TEACHER				III. SETTING				IV. COURSES										V. COSTS		
SITE VISIT FORMS	1	2	3	4	5	6	1	2	3	4	1	2	3	4	1	2	3	4	5	6	7	8	9	10	1	2	3
FIRST VISIT								✓			✓	✓	✓	✓													
SECOND VISIT																											
#1								✓	✓	✓		✓		✓													
#2								✓				✓	✓	✓													
#3										✓				✓													
#4											✓			✓													
#5		✓	✓											✓													
#6		✓	✓											✓	✓					✓							
#7		✓	✓	✓	✓								✓	✓													
#8			✓				✓							✓	✓				✓	✓							
PRE AND POST TESTS																											
ALASKA HISTORY	✓	✓			✓									✓	✓									✓			
ENGLISH	✓	✓			✓									✓	✓									✓			
GENERAL MATH	✓	✓			✓									✓	✓									✓			
DEVELOPMENTAL READING	✓	✓			✓									✓	✓									✓			
ALASKA STATEWIDE		✓												✓				✓									
MONTHLY REPORTS		✓			✓																						
AUDIT TRAILS		✓			✓	✓								✓	✓							✓		✓			
CASE STUDY			✓				✓		✓	✓	✓	✓		✓													
PRE-PROJECT SITE REPORT											✓	✓		✓													
PRE-SERVICE WORKSHOP FORMS								✓		✓																	
DE FACTO DESIGN															✓		✓	✓			✓	✓	✓				
CONSULTANT REPORTS							✓			✓					✓	✓				✓			✓				
DESIGN CONFERENCE															✓								✓				

FIGURE 1. INFORMATION SOURCE BY QUESTION MATRIX

Final Report

The present report constitutes the summary of findings regarding the evaluation of the FY81 pilot study of IST. The report is organized as follows. First, four illustrative settings for the courses are described to better set a context for the results. These four illustrations constitute the site visit reports written by two members of the evaluation team after they had visited the four IST sites in March and April, 1981. The next section summarizes the findings pertaining to each evaluation question, and provides specific recommendations. The last section summarizes the overall findings and makes more general recommendations.

SITE VISITS

In order to be better able to understand the context of IST and its effectiveness in the schools, two members of the evaluation team visited four IST sites during the months of March and April, 1981. The sites were selected by the Director of IST, Alaska Department of Education. They were chosen on the basis of region and size and included a northern, two southcentral, and a southeastern site. They ranged in size from about 20 to nearly 200 registered students.

Each evaluator visited two sites, and remained at each site two or three days. They spoke with the teachers, students, and members of the community, and observed the school and community. In preparation for this, they spent several sessions with a cultural anthropologist who had spent years studying rural Alaska. They were advised on interview and observation techniques in rural Alaskan settings, and on Alaskan native culture and values.

When the two evaluators completed their travels, they wrote summaries of their findings. These summaries were then reviewed by two educational psychologists and an anthropologist for completeness and the insights provided. Questions were raised and revisions of the reports were developed. The revised site visit reports are reproduced entirely in the following sections.

The authors wish to thank Ed Obie, Alaska Department of Education, for his assistance in arranging the visits, and the people at the local sites for their helpfulness and cooperation.

David Cohen

Frank X. Gohs

SITE I CASE STUDY

Sources of Information and Dates of Observations

Site I was visited on March 29 through April 1, 1981. School observations and interviews with students took place during the time school was in session. The IST program was continuously observed in operation for two and one-half days. The only known alteration of the typical classroom routine during this time was that a standardized testing program was taking place.

Informal interviews with teachers were held during the afternoons and evenings of the visit. Additional interviews were held with the Regional Assistant Superintendent of Schools and a local resident who is also a member of the Regional School Board.

Setting

Site I is in the Bristol Bay Region. Approximately 200 residents live on the north and south shore of the narrow end of a lake and one island. It is a relatively isolated community, connected to a First Class City by a 25-mile, state maintained, unpaved road. There is also a small gravel covered private airstrip. The road is not passable during heavy snow buildup and both the road and airstrip are not used during breakup. In the winter and summer, air traffic can land on the lake and, although not a common means of transportation, this site can be reached by boat traveling on a major river. Since residents live around the lake, the community is linked by boats or skiffs in the summer, and in winter by boats, and by snowmobiles that have to traverse the shore line.

Site I is a place of great natural beauty. The lake is part of a chain of interconnected glacial lakes. It is surrounded by mountains and substantial snow cover or wet tundra in the winter,

scrub and grassland in the summer.

Site I is undergoing a transition from a traditional subsistence to a cash economy. During the summer salmon run, most residents leave the community to live close to the Bristol Bay fishing areas. They return in late August when they engage in typical subsistence activities such as hunting, trapping, and ice fishing. Although a few residents are employed in the nearby city, most of the men remain home during the winter months. Therefore, families are intact and the men are home. Residents frequently engage in traditional activities, but occasionally make purchases of goods and technology using the income their fishing provides.

Although the origins of the community are uncertain, Site I was resettled in 1930 by a non-native family. By 1936, several Eskimo families had moved to the village. Today the great majority of residents are Yupik Eskimos. These residents are located in three major areas around the lake. Two of these areas have the following: on the north shore, an elementary school, City Hall and the Health Clinic; on the south shore, a post office, elementary and junior high school, and parking area.

The School and the Students

The north shore school had 11 students in 1980-1981 attending grades kindergarten through sixth. The south shore school had 19 students attending grades kindergarten through ninth. The schools are in two separate locations because of the danger connected with the transportation of young children across or around the lake, particularly during the winter months.

The south shore school consists of two buildings. One building

has a teacher residence and the elementary school. The other contains another teacher residence and two separate areas with the junior high classroom in one, and the kindergarten and cafeteria in the other.

This report focuses on the junior high program in the south shore school. There were seven students in the program; four were eighth graders and three were ninth graders. Upon graduation from ninth grade, all students leave the village to attend a high school boarding program. At the time of the visit, 12 students from the village were attending high schools throughout Alaska.

All IST students were observed using all components. There was one fifth-grade student in the Developmental Reading course. All four eighth-grade students were in the English course. The three ninth graders were in the General Math, English, and Alaska History courses. Generally these courses were taken during specific periods, however, because of the testing schedule this was modified somewhat.

The Role of IST in the School

IST serves three major functions in this school. First, it permits individualization of instruction. Second, and related to the first function, IST permits the teacher to engage in other student-related activities. Finally, IST is used as a supplementary program in the case of one younger student. IST is well understood and supported by the teacher, well-liked by the students, and has been favorably received by the community.

Supervising Teacher

All programs at the south shore school were managed by two teachers (a married couple). The male teacher, who was the prin-

cipal, taught all students in the elementary school; his wife, who was the IST supervising teacher, taught junior high school. Additional teacher support included an itinerant special education teacher and two village women who served as aides. One aide managed the kindergarten program and the other conducted classes in Yupik language and culture.

The supervising teacher has been a teacher for eight years. She has been teaching at Site I for two years, her first assignment. in Alaska. She has earned a Bachelor's degree in Elementary Education and a Master's degree, also in Elementary Education with specialization in Reading. She has had prior training in the use of educational technology and participated in last year's IST Pilot Testing Project. This supervising teacher therefore has skills involving classroom use of the computer and is knowledgeable about IST.

Scheduling and Location of IST Courses

Although the division between this couple's teaching responsibilities was fixed, there was a considerable flexibility in supportive and supervisory functions between the two teachers. Nevertheless, the supervising teacher taught and managed all courses and programs in the junior high school. The school day was divided into eight periods:

Period	Course
1	General Science
2	Math
3	English
4	Lunch
5	Yupik
6	History

Period	Course
7	(8th grade) Reading
	(9th grade) Vocational Education (M.W.F.)
	Music or Art (Tue.Th.)
8	Physical Education (M.W.F.)
	Health Safety (Tue.Th.)

The school day began with students arriving by boat, snowmobile, walking and even, when there was little snow cover, riding bicycles. There was an alertness, comraderie, and happiness visible in the students that was pervasive and continued throughout all activities from the informal beginning of school until the end. This quality was very evident in the two social groupings divided by gender. The boys were very verbal, outspoken and competitive. The girls were more private and communicated by whispering, frequently giggling. There was a pervasive aura of happiness that pervaded activities so that classroom motivation, attention, and activity were high.

The supervising teacher contributed to this mood by seemingly being aware of what was occurring at all times and being very organized and firm. Typical classroom activities involved small group instruction with the remainder of the students engaged in individualized programs. Always speaking authoritatively, yet softly, it was not uncommon for the supervising teacher to issue directions or help to students working individually. As a result, the class was active, structured, and yet, informal.

IST Location in the Classroom

The classroom was of average size and even though occupied by no more than eight or nine people it "felt" crowded. This was because of the large amount of materials stored in the room. Within

this space there were five areas characterized by the activity that took place. In one corner of the room was the teacher's desk. The desk was not used as a place from which to teach, but was used by the supervising teacher for paper work. In the center of the room were desks in rows. Typically, most individualized work was done there. In the back of the room were a blackboard and work tables where group instruction took place. File cabinets and the teacher's desk provided a natural boundary for the computer and IST materials. Materials were not easily accessible and not well-organized but, when needed, the students and the teacher had no difficuly obtaining what they required.

Adjacent to this location, in an open area, were the cassette recorders and control panel on top of a work table. These were used for listening to IST audio tapes and, during class breaks, rock music. There were two cassette machines in use which were in poor condition. The cassettes did not load or unload well. To unload a cassette, the machine had to be held upside down. Frequent adjustments and changing of machines were common and students changed machines and switches by trial and error until they could hear the tape. A Regional School Administrator indicated to this observer that it was found to be more economical to use cassette machines of lower cost and then replace them when they no longer worked. Expensive machines apparently do not last much longer than the less expensive ones. This became evident while observing the students operating the cassette machines; students banged and dropped the units, and in general did not handle them with care.

The last area was a play area. Games and other stored equipment were brought out during recess and break time. The transition

from work to play was informal and smooth, as were all interactivity changes.

Computer Component

The core of the IST course is the computer. At Site I Milliken Math, MECC, and computer games software were used in addition to IST. The students even referred to IST as the "Computer Program". It was evident that the hardware and software were well-maintained by the supervising teacher and the students were proficient in using the equipment. The students also enjoyed the activity. This was apparent in observing them and by their responses during informal interviews.

All students were observed using the computer. On the average, it was used for approximately 10 minutes, every other day, by each student. Unit tests averaged about 15 minutes, and semester tests about 20 minutes. Students used materials as intended, and following the instruction sheets performed the computer activities when appropriate. Although the Second Site Visit Narrative referred to the students writing their names on the blackboard to take turns at the computer, this was not observed. The supervising teacher also indicated students signed up for their turn. However, the same informality evident in all class activities characterized use of the computer. Usually the supervising teacher was engaged in small group instruction when IST students were working independently. Monitoring, assistance, or direction was provided as well as could be when needed. For example, while working with a group on a history lesson, if a student had a problem with a disk the supervising teacher would give directions to the student or walk over to assist and then return to the group.

Ordinarily only one student at a time was ready to use the computer. However, the manner that the computer was used should be viewed in the context of the social group. As previously noted, boys and girls were in cliques defined by gender. All ninth graders were boys, and three of the eighth graders were girls. The boys were more verbal and competitive; the girls were quieter. The boys typically related to the computer activities in a competitive way. They were competitive with each other and continually strived to improve their performance. For example, scores earned were publicly announced and comparisons between boys were made. Self-satisfaction or dissatisfaction with performance was publicly expressed. Therefore, in the same way that this close group of boys play and hunt together, their competitiveness was transferred to their performance of computer activities.

The same interpretation cannot be applied to the girls' performance. They worked more privately and communicated non-verbally or in whispers to each other. They also seemed to need to be close to each other and in some form of contact. Separation from the group, by working at the computer out of eyesight from the others, could have had the opposite motivational effect it had on the boys. This could not be determined by the interviewer as the girls were reticent and not as verbal as the boys. When this observer spoke to then, they tended to blush, look down or turn to a companion and smile or giggle.

The supervising teacher's role in managing computer use was more prominent when programming or technical problems arose. For example, when one student was ready to take the Developmental Reading Section I test the computer wouldn't accept the floppy

disk and wouldn't terminate. On two other occasions students could not progress beyond the General Math Unit test. Although students and teacher accepted these problems in stride, modification of instruction was required and the teacher had to temporarily abandon group instruction in order to assist. On such occasions, the teacher had to modify or create new student disks after the school day ended.

Audio Component

The effectiveness and motivational capability of the audio tapes were difficult to ascertain because in the Alaska History and English courses observed most frequently the audio tapes are not interactive. Students seemed to use this component when required by directions. As mentioned earlier, tapes were not stored systematically, consequently students had to search for the appropriate cassettes.

When using IST tapes, students were observed drawing and communicating with each other rather than attending to the tapes. When interviewed, most students had mixed reactions to the tapes. Several complained about the tapes in General Math being too boring and too long - observations seemed to confirm this. At all times, the students either were clearly uninvolved or appeared to be passively listening.

Written Component

Printed materials appeared to be used as intended. Supplementary materials were accessible and were used in accordance with instructions. Movement through course components was both self-directed and also monitored by the supervising teacher. Students determined their progress and which activity to do based on their

Instruction Sheets. In addition to monitoring progress by checking Instruction Sheets, the supervising teacher collected, graded, and reviewed Listening Guides, Worksheets, Textbook assignments and Projects. Consequently, progress and performance were self-determined and reviewed by the teacher. Students were therefore continually receiving feedback on performance from graded written work and scores on computer activities.

While the Instruction Sheets served their intended purpose, which was to guide students through a predetermined sequence of activities, there were packaging problems. Folders and Instruction Sheets were destroyed and pages from the Teacher's Guide torn out. Many of the materials were still in boxes and students accessed materials from them. As a result, the packaging and storage of Printed Materials and Audio Tapes were viewed as problematic.

Course Content

Interviews with students and teachers did provide useful information about differences between courses and course components. The General Math course was not well-liked by some students. One reason had to do with the pretests. To follow the design, if performance is not adequate on the pretest, then one is required to follow a specific sequence of activities. What appeared to be happening was that students who had the requisite skills were not reading problems carefully enough and proofing answers, resulting in low pretest performance. They then became bored doing activities for which they already had the required skills. If this is a wide-spread problem it suggests the need for development of more valid diagnostics or the need to modify sequencing in accordance with the teacher's assessment of student cognitive skills.

Another problem with the General Math pretests is that they affect the sequencing of activities. For example, in the other IST courses, if the computer is being used, students typically go on to the next activity and go back to the computer activity when the computer is available. Because the pretest in the General Math course determines whether a student should or should not do a lesson, if the computer is occupied the student must wait.

The General Math course was being used in conjunction with the Milliken Math courseware. This was done because the supervising teacher thought they mesh well and the students required drill in fractions, which the IST course lacked. As noted earlier, the Audio Component was perceived as boring and requiring too much time. Consequently, the General Math course was viewed as most problematic because of undependability of the pretests, the Audio Component, and its omission of needed skill sequences.

The Alaska History course was viewed as the best. The students seemed to find it interesting and the teacher liked its uniqueness. English was also liked. From the teacher's point of view, English provided flexibility and continuity because of the supplementary reading materials, and permitted students to remain on tasks longer. In other courses it often appeared that students would be spending relatively short periods of time on each activity as they followed the required sequence. In English, however, longer time periods with extended periods of concentration devoted to one task were observed, confirming the supervising teacher's judgement.

Although it was not clear how effective the Audio Component was as an advance organizer and motivator, the boys indicated they liked the English Audio Tapes involving games the best. Generally,

they did not like the tape format consistent with classroom observation.

There was only one student taking the Developmental Reading course. She was a fifth-grade student. Since she was younger than the others, she remained socially isolated and worked alone. In spite of her age, she was quite adept in use of the computer and at self-direction. The supervising teacher viewed the course as not appropriate for a ninth-grade class because it is based on a seventh-grade reading text. Consequently, credit could not be given the eighth and ninth-grade students. Also, her expectation was that it would be a developmental reading course. She thought the course content did not contain skills her students needed to learn. It is interesting to note that the teaching of reading is viewed by the supervising teacher as one of her strong points. She feels she is capable of providing reading activities as required. At some other site the situation might be different.

It is interesting to note that the boys preferred the tape format of the Ken Cook Learning Station. This tape provides small bits of information and direction in conjunction with visual illustrations which the students interact with by performing manually on a real engine with tools. While a tape format is used for both types of courses, these are used in different ways. In one case, the student remains passive and is required to listen for relatively long periods of time; in the other, they are required to be active and work cooperatively.

Summary

In considering IST courses in the context of this community, one needs to be cognizant of the culture and community values.

Although divided by gender and age, these students, when not in the individualized instruction setting, socialize and work in groups. Outside of school they also socialize and work in groups. The boys for example, hunt, fish, trap, ride snowmobiles and ski together. They also repair and work on equipment. They appeared adept at using the course hardware but working in isolation seemed to be unnatural for them. On the other hand, when working in groups they were not productive unless supervised and directed.

Assuming that the students in this site would have worked more naturally in groups suggests the need to develop more interactive and social components into IST for this population. This would probably necessitate more than one teacher being present in the classroom. While the present teacher/student ratio does not appear to be a burden to the teacher, this is so , in part, because IST permits the teacher to be engaged in other instructional responsibilities while students work individually. The major amount of time required of the teacher occurs outside of classroom hours in programming, reading, and providing feedback on the written materials.

Other considerations are the role of the school in the community, the capacity of the school to educate all school-aged children, and the role of individualization. Clearly, educational costs are high considering three full-time teachers, part-time aides and itinerant help. In fact, the total school population is 42 students divided between two schools with 12 more students attending high school away from the village. With so few students there is a strong incentive to develop programs which are economical and still meet the educational needs of the community.

A member of the Southwest Region School Board representing Site I discussed the need for more community involvement and participation in the school and in the selection of curricula used. He stated that IST was a useful and important addition to the existing curriculum, particularly if such programs can be implemented to make a village high school feasible. He feels that a majority of the community does not like the idea of their youth living away from home in order to attend high school and would prefer having a local high school.

Contrary to adult community values, the students view attending high school away from their village with anticipation. Theirs is a blend of two cultures. On one hand they participate in the old ways such as hunting, trapping, fishing, preparing food and repairing fishing gear. They also assist their families during the fishing season and earn money which is used to purchase goods that are beyond the older culture. The boys particularly were preoccupied with fast and fancy snowmobiles just the way teenage boys in the lower 48 fantasize about automobiles. Their attire, interest in rock music, television interests, and games are all outside of the older culture. So that, while they view themselves as lucky to have so many advantages, goods, and adventures, they at the same time believe village life is constraining and anticipate adventure and expanded, varied social opportunities outside the confines of this isolated community.

CASE STUDY SITE II

Sources of Information and Dates of Observation

Site II was visited from April 6 through April 8, 1981. School observations and interviews with students, the supervising IST teacher, the principal, a part-time teacher and a classroom aide were informally held during the school day. Additional interviews with the IST supervising teacher took place in the afternoons and evenings of the visit.

This observer spent one full and two partial days in the school. The IST program and school in general were considered atypical during the visit. This was reflected both in low attendance and possibly in the low energy level manifest in the students. School had just reopened after a one-week vacation. The second day of the visit was a religious holiday. The school staff attributed the attendance and lack of student enthusiasm to these causes. Consequently, there was much observation of the school and its programs but relatively little of IST participation.

The Setting

The site is one of several communities on a large island. It is located near a Home Rule City which is the commercial and cultural hub of the island and a major fishing port and fish processing center. There are no roads connecting these communities; therefore, transportation is based on air and sea travel. Site II has a city-operated airstrip as well as amphibious landing areas. There are daily scheduled flights between the site and the nearest city, and chartered flights serviced by several private airlines. In addition, the State ferry visits weekly. Except for inclement weather, there is regular transportation to the

nearest city and elsewhere for commercial, recreational and medical needs.

Site II is a relatively new and growing community which was developed after an earthquake and tidal wave in 1964 that damaged the old community. All housing and facilities are therefore of relatively recent origin. Currently, there are plans to construct more housing and the U.S. Army Corps of Engineers has under construction a new harbor facility nearby. In addition there is a 16,000 square foot dock. The local economy is based on fishing for crab and salmon with potential for diversification into shrimp, halibut and bottom fish. There is also interest in developing a seafood processing plant.

Although the community numbers only about 250 at the present time, there are facilities and roads capable of accommodating a larger population. There is a four mile long road extending from the city dock to the airport and three miles of city streets. There is a restaurant, a general store, city hall, fire department, post office and library. There are two schools, churches, and a health clinic that is serviced by a physician who is a local resident.

Site II, surrounded by water, mountains and dense evergreen forests, is a place of substantial natural beauty. In spite of its relatively small size, transportation both outside and within the community results in not as much isolation as one might expect. Housing is fairly close together and confined to one area. Cars and small trucks are used extensively. As previously mentioned, there is adequate regular transportation in and out of Site II, assuring a supply of needed goods.

The residents are primarily of Aleut descent. The community is close knit with many families interrelated. There are some outsiders, but due to limited housing and land availability, the population growth is dependent on planned expansion.

Fishing, the main economic base, is a year around occupation. Because of the municipal service, school construction and local business, employment is fairly diversified. Subsistence hunting and fishing are common but the lifestyle is based on a cash economy. Automobiles, oil heating, television, clothing and household goods all reflect the dependence on a cash economy.

The School Classroom

The school complex is located on the main road north of town. The complex is relatively new with grounds development underway. Its southern area contains two frame buildings, housing the elementary rooms (kindergarten through eighth), administrative office, audio-visual library, cafeteria, and building maintenance facility.

The high school, fondly named by its inhabitants "the box", is a large, square-shaped frame building painted green. The right side of the interior doubles as a gymnasium and classroom. During the school day, this area is divided by a large door. One side is used for physical education classes, the other as a high school classroom. All high school academic classes occurred in this large multi-purpose classroom with three areas having distinct functions. One area contains carpeted bleachers that have portable desk tops attached. These "desks" served as a study/work area where students typically worked alone. In the center of the room were work tables joined to form an area facing a blackboard. This area was used for group instruction involving lecture, discussion and presentation of

visual materials. The third area, involving almost one-half of the perimeter wall space, contained a series of Learning Resource Centers (LRC). Each center, covered by louvered doors, contained equipment and materials and were open to students as needed during the school day. Activities such as science, typing, etc. were conducted by students at these centers. All IST material, equipment and computers were housed in these centers.

The other side of the building contains bathrooms and showers, storage areas and the shop. Students also could go to the basement area, underneath one of the elementary buildings, where a science project involving a fish nursery was being conducted by a high school student under the supervision of the IST supervising teacher.

The Role of IST in the School

Individualization of instruction and computers for classroom use are part of a long tradition at Site II. Individualization continues to be an integral part of the instructional program. For example, two students were observed preparing projects for the state high school fair. One had developed a sophisticated computer program to monitor all variables in the fish nursery. The other student generated a biorhythm program.

There were two computers in use: an APPLE II and a TRS-80 housed in two separate LRCs. A printer was also available. MECC programs, as well as educational programs designed by the supervising teacher, were used. It was because of the supervising teacher's belief in computer-assisted instruction and interest in computer technology, as well as the school's emphasis on individualized learning, that IST was welcomed as an addition to existing course offerings. In total, there were about 20 individualized

programs at the high school being managed by the supervising teacher. IST was being used as part of the total emphasis on individualized instruction.

The Supervising Teacher

The primary high school teacher was the supervising IST teacher. The school principal of both schools also acted as the physical education teacher. There was a full-time vocational education teacher, a part-time high school teacher, and a classroom aide who was heavily involved in the organization of IST.

The supervising teacher had taken training in college to prepare for a career of working with American native peoples. He had a double major in General Science and Social Science and earned a five-year Bachelor's degree. He has taught for ten years, six of those years were spent teaching at an Indian reservation in the southwestern United States. He also spent two years working in the Aleutian Islands, primarily in the development of educational programs. He is highly experienced in computer-assisted instruction and other educational media and technologies. He has been teaching at Site II since the Fall of 1979.

Students Enrolled in IST Courses

The high school population (grades 9 through 12) consisted of 20 students. Two students attended school outside the community and there were 7, 5, 3, and 3 students in the ninth, tenth, eleventh, and twelfth grades, respectively. Of the 20 students, only 5 are enrolled in IST courses. In English, 4 tenth grade boys (15 and 16 years of age) were enrolled. One 14 year-old ninth grade girl was enrolled in General Math. Two 14 year-old girls came to the high school for IST. One was taking General

Math, the other Developmental Reading.

Scheduling and Location of IST Courses

The school day was divided into seven academic periods. Within each period a fairly large number of activities were occurring. For example, in one typical period with seven students present, the part-time teacher was working individually with a special education student in Math, two students were involved with Stars Math, one student in computer programming, two in advanced English, and one with IST English. The part-time teacher was in continuous motion, checking and assisting all students.

IST was used in a highly structured format within a tightly organized schedule supervised by the part-time teacher and the classroom aide. This approach was based on the belief that the students generally were not self-pacing and required close supervision. The schedule listing all subjects for all students was prominently posted.

The major equipment and printed materials were housed in the Math LRC. The Math LRC contained the APPLE II, worksheets, progress sheets, disks and supplementary materials. All materials were neatly stored in separate areas and quite accessible to students. The space was relatively confined and distant from where other students might be working. There was, therefore, a great deal of privacy and absence from distraction when working on the computer. However, the computer was so confined that there was poor ventilation which resulted in occasional overheating.

Several centers distant was the Science LRC. It contained a new Bell & Howell cassette deck. Students listened to audio tapes for IST here. Next to the machine was a box of audio tapes

and IST print materials. All other written work and projects were performed at the work tables or the desks in the bleacher area. On the door of the Math LRC was a blackboard listing IST assignments for that day for specific students. The blackboard assignments specified the computer activity and audio tape to be done for two students, as well as any further reading assignments to be done if the prior activities were completed. These directions indicated that although they followed the intended sequence in the Progress Chart, there was an expectation for a student's speed and ability. Clearly students were not expected to be self-pacing. Of the two assigned activities, the computer activity consisted of seven vocabulary items. The Audio Component was a brief introductory tape. Estimates for total time to complete both activities would be between fifteen and thirty minutes. In effect, students were either not expected to work rapidly or the expectations for their performance might have hindered their progress. Students were expected to leave Progress Charts for inspection by the aide or the supervising teacher to determine activities that would be assigned the next day.

The computer schedule posted on the Math LRC door indicated considerable availability of computer time for all IST students and that most students even though they were taking the same courses, were working in different periods. Computers were generally available for use when not scheduled for instruction. The TRS-80 was scheduled for Math programs, Basic Computer Language and Science projects. The APPLE II was scheduled mostly for IST. The following schedule indicates the IST and non-IST use of the APPLE II for each class period.

Period	Student	Purpose
1	Non-IST Student	Programming & Research
2	1 IST Student	IST English
3	1 IST Student	IST Developmental Reading
	1 IST Student	IST General Math
4	2 IST Students	IST English
	1 IST Student	IST General Math
5	Open	
6	1 IST Student	IST General Math

As mentioned earlier, relatively little IST student participation was observed. Within this large space, with as many as three adults supervising and with students separated in various areas working individually, IST participation was so subtle that it sometimes went unnoticed.

Students generally displayed little overt enthusiasm for the work they were doing. Sometimes small clusters of students would form and their mood would appear to change to a happy one. Mostly in the transitional moments overt expression of enthusiasm appeared. IST students behaved no differently. It was perhaps for this reason that emphasis on "pushing" and "isolating" students to work was so pervasive.

An example of a typical behavior pattern was given by a tenth grade IST English student who was observed when he first went to the LRC, found his instruction sheet and went to the Science LRC. He remained seated and inactive for about ten minutes. He then obtained his head set and cassette and started listening. After a lengthy period, during which time he was glancing around and appeared to be day dreaming, he finally disconnected the apparatus and opened his text.

One problem observed with the computer was with a student disk. A student's successful completion of computer activity was erased. Assistance from the teacher was requested and quickly obtained. The student was directed to the next activity on the instruction sheet. This problem was said not to be unusual. It was to be rectified that evening by the wife of the supervising teacher who, because of her computer background, assisted her husband in programming.

Students interviewed generally viewed the audio tapes as not interesting. In contrast, the computer activities were liked. These student impressions were consistent with observations. On two occasions, CAI was observed, and students appeared to be more intent and involved with these activities than others.

The Teacher Component

The major teaching responsibility in the high school was with the supervising teacher, with another teacher assisting. The supervising teacher indicated that he typically spent five or more hours a day in preparation for class, and reading and grading student papers. Therefore, total responsibilities within and outside of class were extensive and very demanding. Because of this, the aide was critical to implementation of IST.

Although she had other responsibilities as well, the aide played a major role in IST. She made sure all materials were available and in order. She made copies of materials and wrote daily assignments for eighth graders on the board. In addition, she made sure students were doing and completing activities as intended, and she corrected materials. She also had to determine which students required more supervision, and which were self-

pacing, and to intervene as necessary.

The supervising teacher incorporated group instruction in a program that, prior to his coming to Site II, was completely individualized. Observation of group instruction, however, revealed a quiet, listless quality in students. The supervising teacher demonstrated a pensive, low-key, soft-spoken manner when working alone with students. He became an enthusiastic, stimulating facilitator when working with groups of students. The students did not appear to make appreciable shifts in their verbal responding or interaction. They appeared reserved, quiet, and subdued. When interaction was evident, it was often inappropriate, occurring at LRCs or on the bleachers. Typically, one or two students would talk to each other when they were expected to be working on an assignment. The significance of these observations was viewed as directly related to IST, with regard to management and self-pacing.

Course Content

Students interviewed tended to be reserved and reticent. Talking to them about IST was difficult and responses may not have been a reflection of their true beliefs. Nevertheless, the consensus was that they like IST courses. They had a preference for IST courses over other individualized programs because they found them more helpful and easier to understand.

Students did not appear to react to scores obtained on computer activities. It was assumed that the observed countenance was a cultural characteristic. Whether viewed as a cause of the absence of expression or as a result, the grading policy was based not on the quality of performance but on the amount of progress made.

The general interpretation of observations of student motivation was that motivational patterns tended to be extrinsic. Moreover, they needed continuous supervision to remain on tasks. An alternative explanation, posed by the supervising teacher was that Site II students were very intelligent; consequently, they worked when challenged. IST courses were viewed as too general and not at a sufficiently advanced level. Whether this is true or not, it should be noted that the majority of IST students were tenth graders ranging in age from fifteen to sixteen. This was not the population these courses were designed to serve. The supervising teacher also viewed the General Math course as too basic relative to the advanced level of the students (one ninth grade and one eighth grade student were taking IST General Math).

Aside from the courses being too basic, the supervising teacher felt that the degree of isolation in which the students work reduced motivation. Therefore, if he were to use IST courses again, he would attempt to create a competitive situation to enhance effort.

Related to this was an absence of practices that deviated from the IST design. Minor exceptions included the absence of self-pacing, with the teacher making daily assignments. These assignments followed the intended sequence. Also, in one case a student was cycled into just one unit of the General Math course. This deviation was obviously based on the teacher's judgement that this student needed to develop only the skills contained in this one unit.

Summary

Overall impressions of Site II suggest a combination of unique factors influencing IST implementation. Clearly the reserved and reticent mannerisms of the students may have been a cultural characteristic. In conjunction with this, the lack of stimulation existing in the physical environment contributed to a slow-paced classroom climate. The past history of learning in individualized programs and its effects on interpersonal and verbal skills was viewed as a problem, and there was a desire to introduce programs involving group participation and verbal interaction. Further, the heavy emphasis on individualized programs produced inordinate demands on the teacher. This was manifest in the continual shifting from student to student, program to program, and problem to problem during the school day. Added to this were the five to six hours a day of preparation and grading. During this observer's visit, the supervising teacher was waking at 1:00 a.m. to go back to the school to prepare. In other words, his work day began six hours before school began.

The influences of these factors on IST implementation are summarized below:

1. A large number of preparations were required of the teacher because of the number of different courses and the individualized nature of them. The advantage of IST for the teacher is that the courses come organized and prepared resulting in less time required for preparation. The amount of time required for grading and reading assignments was about the same as for other individualized courses, however.

2. The population for which IST was designed was not the one primarily using it. IST was designed for ninth grade students. Eighth through tenth graders were taking the courses at Site II and ranged in age from 14 to 16 years.

3. Since students from lower grades were going to the high school to take IST courses, and they were working separately from each other and their peers, there also was no opportunity for interaction or discussion for them because no other students were taking the course at that time.

4. If the supervising teacher's assessment of the ability level of Site II students was correct, that in combination with their history of individualized instruction, would suggest a need for a greater variety of courses including course options in conjunction with branching programs. While IST is useful at Site II, it may not offer the variety or depth of content that is necessary. The development of a greater variety of branching programs would free the teacher from course development and, with utilization of the aide, free the teacher for more creative and interactive responsibilities in the classroom. In this regard IST may have the potential to reduce the rate of teacher "burnout" and the turnover rate, enabling school districts to have more continuity in their teaching staffs.

5. A major question, based on the students' motivational patterns, is the appropriateness of the formal design. A major purported advantage of individualized instruction is the development of intrinsic motivation. Observation did not confirm this. On the contrary, IST students, in particular, were not self-pacing or persistent, and self-pacing and self-direction were not in

evidence. Direction was mostly teacher-imposed.

6. Finally, the courses may be modified or used differently in schools, without appreciable alteration of the instructional design. Possible approaches might include: a) a greater variety of courses and course options; b) use of diagnostics in all courses to determine placement and sequence; c) improved advance organizers through the teacher, print, and audio components; and d) as an alternative to teacher monitoring and grading based on work completed, increased use of projects, group discussions, consensus information, and natural reinforcers.

SITE III CASE STUDY

Sources of Information and Dates of Observations

Site III was visited by a member of the evaluation team from Educational Skills Development (ESD) on March 30 to April 1, 1981. The purpose of this visit was to observe the operation of the IST courses at the school and to discuss their operation with administrators, teachers and students. Observations at the school occurred on each morning of the visit while the school was in session. Discussions with the principal, the IST supervising teachers and the students enrolled in the IST courses also took place during the visit. Information about the site, the school, the teachers and the students was obtained by the observer before arriving at the site.

Setting

Site III is located less than 100 miles from a major city along a paved highway. It is one of the main river-freighting centers in Alaska, with many townspeople holding railroad-related jobs. An estimated 550 people live at this site; 60% are Caucasian and 40% are Athabascan Indian. Most Caucasian adults and about one-half of the Athabascan Indian adults have at least completed high school. A few houses in Site III are old and appear to be not very sturdy, but many are more recently built log cabins. One grocery store, two bars, and two restaurants are available to the residents of this site. A community center and the school gymnasium provide the children and adults in the community with regularly scheduled recreational activities.

School

The children at this site attend the local public school.

The school provides an education for 190 students enrolled in kindergarten through the eighth grade and 60 students enrolled in the ninth through twelfth grades. Eighteen faculty members are employed to teach the total of 250 students in the school. The ninth through twelfth grades are departmentalized, thus the faculty teaching these grades teach only courses within their areas of expertise. The classes are conducted in two school buildings. The children in the elementary grades attend school in an old log cabin-like building. The building for the junior and senior high school level children is more modern, and includes a cafeteria, library, science laboratory, typing room, faculty lounge and administrative offices. Located behind the more modern building is the gymnasium, a source of great community pride. Each night of the week the adults and children use the gymnasium to participate in some regularly scheduled athletic or community activity. Construction has recently begun on a new school building, expected to be completed by Fall, 1981. The junior and senior high school classes will be conducted in this new building, and the classes for the elementary grades will shift to the present junior/senior high school building. The building under construction is expected to have, among other additions, a computer room, indicating the school's increasing commitment to the use of computers in education.

Role of IST in the School

Site III is one of the largest IST pilot study sites in terms of total school enrollment, offering three IST courses: 1) English, 2) Developmental Reading and 3) General Math. The fourth IST course, Alaska History, is not offered because a

teacher at the school has developed his own Alaska History course. Fifteen students are enrolled in one or more IST courses. Two teachers supervise the IST courses at the site, one supervises English and Developmental Reading, the other supervises General Math. Although teachers' aides are used in the school, neither supervising teacher receives assistance from the aides.

The primary value of the IST courses to this site is that they provide the school a way to offer instruction to students who need or want a specific course, but for which there are too few students requesting it to warrant a regular class. In particular, the three courses presently used provide remediation for students who either failed an English or Reading course and needed the credit, or who ranked very low on a Math placement test. Without the IST courses, these students would have been placed in a regular class at a level inappropriate for them or would have had to repeat the course they had previously failed with the same teacher. Neither situation is desirable. The students enrolled in the IST courses receive more individual attention and can study material more appropriate for their knowledge level and pace of learning than if they were in a regular class. Also, students enrolled in an IST course who have failed a similar course, have an opportunity to see another perspective on the subject matter and avoid the possible animosity that could develop between a student and the teacher who failed him/her.

Supervising Teachers

The supervising teacher for the English and Developmental Reading courses has ten years of teaching experience, all at Site III. She has a Bachelor's degree in English and was experienced

in the educational use of programmed instruction and audio and video tapes prior to becoming involved in the IST project. However, she had relatively little prior experience in computer programming or the classroom use of computers. Although she feels more comfortable conducting her class in lecture format, she felt well-prepared to manage student learning when several different kinds of activities were going on at the same time in a class. She also felt well-prepared to maintain the student performance records required of teachers supervising IST courses.

This supervising teacher has structured her class so that students can progress at their own rates. However, each marking period she does require an average of one completed lesson per week. This requirement serves as a motivator, providing the students with a minimal goal to attain. Students who spend at least half of their fifty-minute class period in concentrated work have no trouble attaining the goal. She bases a student's grade on teacher-scored activities (i.e., worksheets and projects) and Unit tests. Various reductions in a student's grade are made for students who do not complete the required number of lessons.

The supervising teacher for the General Math course has eight years teaching experience, the last six in Site III. He has a Bachelor's degree in Mathematics, was experienced in the educational use of programmed instruction and computers and was well-prepared for writing computerized instructional programs prior to becoming involved in the IST project. However, he had relatively little prior experience in the classroom use of audio tapes. Although he indicated preference for conducting his class in lecture format, he felt moderately well-prepared to manage

student learning when several different kinds of activities were going on in class at the same time. He also felt moderately well-prepared to maintain the student performance records required with IST courses.

This supervising teacher has structured his class so that students can progress at their own rates. He does not require his students to complete some minimum number of lessons during any given period of time, but he does partially base student grades on number of lessons completed. His criteria for grading are scores on teacher-graded activities (i.e., worksheets and projects) and Chapter tests. He then adjusts the grade based on the greatest number of lessons completed by any student during a marking period. He uses the optional activities available in the General Math course if he feels they are appropriate.

The supervising teachers spend most of their time during the class either keeping student records, grading IST course activities, or providing one-on-one instruction to students requesting it. Two of the major functions of IST supervising teachers are student performance record-keeping, and computer operations. Although both teachers perform these functions, they have divided the responsibility so that one has the major responsibility for the record-keeping and the other for computer operations. This arrangement works well. The former teacher is able to complete most of the record-keeping during the IST class and her lunch period. The latter is very enthused with the possibilities for computer use in instruction. He teaches a computer programming course for junior and senior high school students and spends several evenings a week enhancing his own programming skills. During

this contact with the computer, he is able to perform the computer operations required of teachers in the IST courses.

Both supervising teachers are teaching IST courses in their area of expertise. They both strongly feel that a content expert should, if at all possible, be supervising the courses. They feel the grading of the course activities and explanations of misunderstanding and wrong answers are important aspects of the IST courses that cannot be adequately handled by someone who is unfamiliar with the content.

The English and Developmental Reading supervising teacher recently took a one-month leave of absence. Her substitute had no training in the IST project, nor was she very familiar with the operation of the IST courses at the school. Despite this lack of familiarity with IST, her class ran relatively smoothly during the two days (her first two) that her class was observed. The students in this class worked independently; they knew how the class operated and showed the substitute how the course worked. The substitute seemed comfortable in this setting. The primary responsibility for record-keeping and sole responsibility for computer operations initially shifted to the remaining supervising teacher in the other's absence. The substitute, however, was expected to become more familiar with the record-keeping and take on more responsibility as the month progressed.

Students Enrolled in IST Courses

Fifteen students (mean age = 15.7; mean grade = 10.1) initially enrolled in at least one of the three IST courses available at this site: two students enrolled in English (mean age = 16.0; mean grade = 9.5), six in Developmental Reading (mean

age = 15.7; mean grade = 10.0), and eight in General Math (mean age = 15.7; mean grade = 10.1). Presently, both students are still in English, only three are left in Developmental Reading and seven remain in General Math. One Developmental Reading student dropped the course because he did not function well in an individualized setting. Another student completely dropped out of school when he became 16 years old. No reason was reported for the departure of the other Developmental Reading student. The one General Math student who dropped had completed her high school Math requirements after one semester in the IST General Math course and elected to take Business Math the second semester.

The students seem to be functioning relatively well in the individualized setting of the IST courses. They work well independently, moving from one activity to the next without waiting for someone to tell them what to do. Their progress charts are kept up-to-date and these direct each student to his/her next activity. The students find IST courses easier than their other courses. Overall, they like the IST courses. They particularly like using the computer. They find the computer interesting and would like to have greater access to it. (Besides the 50 minutes in class, the computer is available only during the 30 minute lunch period.) One student in English has become very interested in the computer, motivating him to do well in his Math courses so that he will be able to take a computer course next year. Most students considered different aspects of the IST courses boring, but this seemed specific to an individual. Most students would like to take other courses using the IST format. One student in particular wants an U.S. History course because he recently failed

U.S. History, but said that he thought he could pass a similar IST course.

Only one student said she does work in the courses at home. One supervising teacher views the lack of homework as a serious deficiency of the IST courses. He has not required homework of his General Math students this year, since his understanding is that the IST courses were to be implemented unaltered this year. Next year, he intends to supplement the General Math course with homework.

The students spend very little time working with each other during the class period. One supervising teacher seems neither to encourage nor discourage student interaction. If it occurs in her classroom, the students have initiated it themselves. The other supervising teacher demands relative quiet in his classroom. Students, however, do help each other at times, although they seem annoyed when another student asks for assistance when they are concentrating on their own work.

Most students seem to work well on their own. Even those students who at the beginning of the class period are disruptive, go through spurts of doing concentrated work each class period. The two English students have progressed rapidly through their course, completing it in 20 to 25 weeks. Some friendly competition between each other has served as a primary motivation for them. These students, however, are the exception. They spend nearly the entire 50 minute period in concentrated work, but neither one works on the course other than during the class period. The Developmental Reading students typically spend about one-half to two-thirds of the class period making a concentrated

effort to do their work. Besides the lack of consistent effort, these students were progressing more slowly than their supervising teacher would prefer due to the presence of a very disruptive student in the class. This student has since become 16 years of age and quit school; the other students are now gradually settling down, spending more time on their work. All General Math students began at Chapter 1 as dictated by the pre-course diagnostic test. A few students were able to skip lessons in Chapter 1 based on attaining a score of 100% on a pre-test, but only on rare occasions was a 100% score attained on a pre-test after Chapter 1. Most students are progressing at about the same rate and will complete approximately six or seven of the nine chapters by the end of the school year.

Scheduling and Location of the IST Courses

The three IST courses offered at this site are taught in the same self-contained classroom during the second and third class periods each school day -- the English and Developmental Reading courses are taught during the second period; the General Math course meets during the third period. Each class period is 50 minutes in duration. The classroom in which these courses are taught is relatively small, about one-half to one-third the size of a regular classroom. The smallness of the room, however, does not seem to adversely affect the learning atmosphere in the classroom. Comments by the students that they have enough room to do their work support this observation. (Six to eight students are in the room during any single period.) The teacher's desk in the classroom is located at the front of the room with the students usually seated along the two side walls. Three cassette tape

recorders located on top of a filing cabinet in front of the room are available to the students. One calculator and two rulers are located in the teacher's desk. The cassette tapes, printed course materials, and individual student folders are located on book shelves in the front of the room. Two APPLE computers are located on large office desks in the back of the room, each with a 21 inch television screen for easy viewing. The student and course computer disks are located in the drawers of the office desks.

Computer Component

The General Math supervising teacher considers the computer as the key component of the IST courses. It keeps records of student progress and grades, doesn't tire of drilling the students on concepts/skills, points out areas in which they are having difficulties, directs them to remedial activities, and guides the students through the course.

Only one of the two APPLE computers at this site was available for use in the IST courses during the site visit. Disk drives #2 and #3 for the other computer were being repaired. Even with one computer not available for IST use, the students did not seem to have to wait very long to use the one that was operating. Students who had to wait, typically moved on in their work, coming back to the computer when it was available. Other than recent problems with the two disk drives, very few problems have occurred with the APPLE computers. The problems that do occur usually result from static electricity and power surges. The supervising teachers have been able to correct most minor problems that have occurred.

The location of the computers in the same room with students

working on other components of the course, and the smallness of the classroom, create a potential problem. The large television screen is in the immediate line of sight of several students. When a student is using the computer, other students can be distracted from their work. This distraction is generally temporary with the students returning to their own work after a few minutes. At other times, however, these students set aside their work to watch what is happening on the computer monitor.

Initially, this situation seemed to be a drawback of having the computers in the classroom. However, at a second glance it may be seen as a benefit. The distracted students seem to be thinking about the questions along with the student using the computer. This may take a few minutes of each class away from the students' own studies, but most students take short breaks during the class period anyway. Also, if a student has completed the activity seen on the computer, his/her attention to it may serve as a review, or if a student has not completed the activity, he/she may find its content interesting and thus be motivated to progress through the course to that activity. The principal was alarmed when she first observed the distraction caused by the computer, but she has since recognized the possible benefits and is now encouraged by how well the course proceeds in such a classroom setting.

Computer test scores have been higher than written test scores according to one supervising teacher. She hypothesized that this may be because, through interacting with the computer, students come to realize they must take care to be precise in their responses on a computer test, but need not take as much

care on their written tests. The value of being precise in the way one responds to a question is a valuable lesson to be learned. Use of the computer may be a good way to teach this lesson since it has no conscience about telling a student he/she is incorrect and the student may be more willing to accept criticism from a machine than a person.

Another point concerning the computer tests was voiced by a student who stated he would like to be able to go over his test answers before they are graded. The computer does not afford the student this opportunity. The computer is programmed so that as soon as the student hits the space bar -- after being informed whether or not he/she has answered a question correctly -- the next question appears. Before hitting the space bar students should: 1) note whether or not their answer is correct; 2) note what the correct answer is if they have been incorrect; and 3) try to learn from the feedback. These three activities will typically require the students to wait several seconds if they have been incorrect, before hitting the space bar to get the next question. Some students, however, do activities 1 and 2 only and then simply try to match the correct answer to the question, rather than trying to learn from the feedback. These students also wait several seconds before hitting the space bar when their answer was incorrect. Other students only note whether or not their answer was correct and immediately hit the space bar to get the next question. The students who do all three activities are properly using the feedback provided by the computer; the students who do not try to learn from the feedback are using it incorrectly; and students who only note whether or not their

answers are correct are not using it at all. An attempt to educate the students in good study skills, particularly in the use of the computer feedback, may be desirable. Another option may be to reprogram the computer not to respond to any command for several seconds after feedback is provided.

Several errors in the computer activities (i.e., misspellings, inconsistencies) were observed. Although the supervising teachers have found only a few errors in the computer activities, some errors could easily go unnoticed unless someone very familiar with the content checked each activity. Most errors are first noticed by the students who bring them to the attention of the teacher. However, many errors could be subtle enough that only the most advanced students would notice them. An example of this was in the General Math, Lesson 56 in which the students do an activity renaming percents as ratios, and are asked to express their answer in lowest terms. One question has an answer which is not reduced to lowest terms: 1.25% = 5/400. These errors in the computer activities can be misleading and create confusion for the students. A sample of the activities in each course may need to be checked to determine the prevalence of the errors.

Course Content

The content of the three IST courses offered at this site was considered by the supervising teachers to be comparable to other courses on the same subject matter, but easier. These observations were verified by the students who nearly unanimously felt their IST courses were easier than other courses they were taking.

The General Math supervising teacher observed that most

students need help with the games and puzzles section of his course, and the word problem-solving initially seemed very difficult for most students. He has, however, received fewer requests for help with these problems as the course progressed, possibly indicating that the students have become increasingly more competent and confident in their ability to solve such problems.

Summary

The IST courses are useful in this site and very beneficial for the students. They provide those students who have difficulty learning in the structured classroom setting with the alternative of individualized instruction. One such student is enrolled in English. He did not do well in the structured classroom setting due to real or imagined pressures from which he retreated. He does not feel these pressures in the self-paced setting of the IST English course. He is one of the two students who will have completed the entire course in 20 to 25 weeks.

Students who are slow learners also benefit from the IST courses. In the structured classroom setting the teacher progresses at his/her own pace, typically maintaining a pace consistent with that of the average student. The slower students in this structure fall further and further behind in the classwork as the school year progresses, eventually dropping out of the class -- if not physically, at least mentally. In the IST courses, these slower students may not seem to progress very far, but they will be reasonably assured that they have mastered the material in the parts of the course they have completed.

The individualized, self-paced, and multicomponent aspects of the IST courses seem to have their advantages for the students.

The fast and the slow students need to take short breaks while they study. These breaks can be 30 seconds to several minutes long, and give the students a chance to relax and catch their breath. In a structured classroom these breaks may occur when the teacher deems them necessary, not the student. Also, as mentioned earlier, several students consider different aspects of the course boring. Since the content of the IST courses is presented in several ways, the student has some assurance that at least one of these options will not be boring.

The potential for continued use of the IST courses at this site is excellent. The principal was not involved in the original decision to use the IST courses since she began her tenure as principal after the IST courses had been ordered. She is now enthusiastic about their potential for expanding the ability of the school to offer courses more nearly matched to a student's ability, learning style, and interests. She intends to continue to use IST courses for remediation, and also would like to have other IST courses available in subject areas in which, at most, three to five students a year might be interested. This is too few students to warrant offering a regular class, unless an IST-like course were available in the particular subject area. Two subject areas she specifically mentioned were Chemistry and Physics.

The supervising teachers are also enthusiastic about the potential uses of the IST courses in their classes. They echo the principal's wish for more IST courses, particularly in subject areas in which too few students have an interest to warrant offering a class. Even the students and another teacher expressed

interest in the continued and expanded use of IST courses at this site.

Even though the attitude toward use of the IST courses at this site is examplary, some problems do exist. These problems generally relate to various aspects of the courses themselves (such as hardware problems, need for better use of computer feedback to students, inaccuracies in the computer activities) rather than the IST model. Despite these problems the courses have been successfully implemented and used effectively here.

SITE IV CASE STUDY

Sources of Information and Dates of Observation

Site IV was visited by a member of the evaluation team from Educational Skills Development (ESD) on April 6 through 8, 1981. The purpose of this visit was to observe the operation of the IST courses at the school and to discuss their operation with administrators, teachers, and students. Observations at the school occurred while school was in session on the afternoon of April 6, the morning and afternoon of April 7, and the morning of April 8. Discussions with the part-time principal, the IST supervising teachers, the IST aide, the librarian, and the students enrolled in the IST courses also took place during the visit. Background information on the site, the school, the teachers, and the students was obtained prior to the visit.

Setting

Site IV is located in Southeast Alaska on the shore of an island, accessible only by boat or float plane. Its primary industry is commercial fishing with seasonal construction and a newly developed tourist trade adding some support to its economy. An estimated 475 people live in this site, mostly Tlinget Indians. About one-half of the adults in the community have at least completed their high school education. One general store and one restaurant service the residents of this site. A lodge, located on the eastern shore of the community, is available to visitors and tourists for use as living quarters during their stay. Athletic events are important activities in the lives of the residents of this site. Besides water sports (i.e., fishing, boating, swimming), two gymnasiums are available in which regular-

ly scheduled athletic and community activities occur.

School

The children at this site attend the local public school. The school provides an education for 70 students enrolled in kindergarten through the sixth grade and 70 students enrolled in the seventh through twelfth grades. Nineteen faculty are employed to teach the 140 students in the school. The ninth through twelfth grades are departmentalized; thus, the faculty teaching the grades generally teach only courses within their areas of expertise. The classes for the elementary grades are conducted in a building separate from the one for the junior and senior high school. The latter building includes classrooms, a cafeteria, band room, faculty lounge, administrative offices, science laboratory, and learning resource center. Located behind this building is another small building recently built specifically for shop classes.

Role of IST in the School

Site IV is one of the largest IST evaluation sites in terms of school enrollment and has more students enrolled in at least one IST course than any other site. It served as a pilot site in 1979-80, offering Alaska History and English. These two IST courses were again offered this year, with Developmental Reading. General Math was not offered because the course was not available at the start of the school year. It was felt that the students would have difficulty adjusting to a different type of math course at mid-semester even though they were using the same text that is used in the IST course. Two teachers supervise the IST courses at the site. One teacher supervises Alaska History and Develop-

mental Reading, the other supervises English. In addition, an aide supervises student use of the computers and handles all responsibilities concerning computer operations.

The primary value of the IST courses to this site, according to the part-time principal, is that they allow for more flexibility in scheduling classes and hiring school personnel. Students can resolve schedule conflicts by enrolling in an IST course which they can take any time during the school day. Staffing problems can be overcome by having non-content experts supervise the IST courses. One such problem arose this year at this site when the sudden resignation of a teacher required a shifting of teaching responsibilities among the faculty. The availability of the IST courses gave the administration greater flexibility in dealing with this staffing problem, finally resolving it by having a science teacher supervise the IST English course.

Supervising Teachers

One teacher supervised the two IST courses (Alaska History and English) offered at this site during the 1979-80 school year. She continued to supervise these two courses through the first half of the present school year and in addition served as supervising teacher for IST Developmental Reading. Due to a shifting of teacher responsibilities at mid-year at this site, she no longer supervises the IST English course, but continues to supervise the other two IST courses. This supervising teacher has five years teaching experience, two at Site IV. She has a Bachelor's degree in Anthropology with teaching experience in English/Reading and History. She was experienced in the use of computers and audio tapes in education. She, however, had rela-

tively no prior experience in computer programming or programmed instruction. Also, she felt well-prepared to manage student learning when several different kinds of activities are going on at the same time in a class, and to maintain individual records of students' performance.

This supervising teacher has the major responsibility for the record keeping associated with the operation of the IST courses at this site. She has been relieved of homeroom duties for 15 minutes of each day to take care of IST business. Typically, she spends her time during the Alaska History course correcting papers and responding to student questions. She has set mid-quarter goals for her Alaska History students so they can gauge how they are progressing, and she requires the Alaska History students to complete Units I, III, and IV by the end of their first year of enrollment in the course. If they decide to enroll in the course as an elective for a second year, they are required to complete Units II and V. She bases student grades on worksheets, hand-in activities, and unit test scores. She sometimes encounters problems, however, with getting written unit test scores since some students refuse to do them. These students do the computer tests but don't like to write so they will not complete the written tests. In these situations, she uses only the computer scores. She does stress writing and grades written work on style as well as content, however.

The supervising teacher for the IST English course has five years teaching experience, two of them at Site IV. Before taking over the English course at mid-year he was an elementary school science teacher at this site. He has a Bachelor's degree in

biology, and had no experience in the educational use of computers, programmed instruction or audio tapes prior to becoming involved in the IST program. He also was not well-prepared to write computer programs, but he did feel moderately well-prepared to manage student learning when several different kinds of activities are going on at the same time in a class and to maintain records of students' performance. His main function in the course seems to be as overseer and grader. He requires students in the IST English course to complete two units per quarter. He considers this a minimal requirement.

Although two IST courses at this site are presently supervised by a teacher who is an expert in the content of these courses, generally the IST courses at this site will be supervised by teachers who are <u>not</u> experts in the IST content areas. The part-time principal stated that the site intends to use the IST courses to provide instruction in content areas for which it is in need of teachers, and thus take advantage of the intended design of the courses to be taught by people who were not experts in the specific content areas. He also stated that he generally cannot justify using an IST course in a content area in which a teacher is available.

Both supervising teachers seem to have attitudes different from the part-time principal on this issue. They welcome the availability of the IST courses in the content area in which they are familiar. One teacher is supervising Alaska History and Developmental Reading and previously supervised English - each are within her area of expertise. She feels she is able to provide the students a better course using the IST materials. She

is able to give more individual attention to those students who need specific help. She can supplement the course with activities which give the students a more complete perspective on certain issues. She can also identify areas within the courses which she feels are weak but important. She then designs activities to strengthen the instruction. She would not be able to do these things unless she had expertise in these areas.

The other teacher whose expertise is in science, is presently teaching IST English. He is interested, however, in examining the IST General Science course for possible future use. He had no prior exposure to the IST program before taking over responsibility for supervising the IST English course. At the time of the site visit, he had been supervising the course for about three months, but as yet he did not appear to have gained a grasp of his role in the operation of the class. He feels kind of lost, wanting to do more but not finding direction on what more he could do. He specifically requested that more supplemental activities (i.e., films) be made available to the teacher to be used at his/her discretion. Although he is relatively unfamiliar with the IST format, he may not feel so lost if he were teaching a course within his area of expertise. He would likely know what supplemental activities may be beneficial for enhancing a student's understanding of a concept or development of a skill. It is important to note that the IST courses were designed with the intention that non-content area experts could teach the courses. However, this science teacher does not feel completely comfortable teaching English. However, several variables may be contributing to his situation, among them, his taking the course over at mid-year,

his unfamiliarity with the IST program in general, and his unfamiliarity with teaching English.

The Aide

The responsibilities of the aide at this site include supervising computer use and operations of the IST courses. She has a high school diploma, but had very little experience in computer use prior to becoming involved in the IST program. Despite her inexperience, she seems fairly competent and organized. She updates student computer records, does all computer supervisory functions, and records student progress and test grades. She is usually available to assist students while they are using the computer, particularly with technical problems. Her interaction with students, however, seems to be inconsistent. At times she is available for assistance, but the students have to ask her for it. At other times, she appears to be too involved with the students. For example, she gives them the disks they need, although they are capable of getting their own disks. She also volunteers content as well as technical help whenever she thinks the students need it. This volunteered help may not always be best for the students. They might gain more by thinking their problems through by themselves.

The part-time principal would prefer not to use an aide with the IST courses. He considers it an inefficient use of her time and the school's money. He seems to think that the aide would be unnecessary if the computers were located in the classroom rather than in the learning resource center where they are presently located. The IST courses, however, are conducted in different classrooms and moving the computers from room to room

during a school day is infeasible. The part-time principal's conception of the aide's role seems to be to make sure the students do their work and monitor the use of the computer. He does not seem to be aware of the other functions the aide serves. If the aide position were eliminated, more record-keeping and computer operations responsibilities would fall upon the shoulders of the supervising teachers.

Students Enrolled in the IST Courses

Twenty-seven students (mean age = 16.4; mean grade = 10.5) initially enrolled in at least one of the three IST courses available at this site (one additional student is enrolled in the Alaska History course for a second year). Initially, 15 students (mean age = 17.5; mean grade = 11.5) enrolled in Alaska History, 11 students (mean age = 14.9; mean grade = 9.0) enrolled in English, and five students (mean age = 17.0; mean grade = 11.2) enrolled in Developmental Reading. Presently, all students are still in Alaska History and English but only three students remain in Developmental Reading. Two Developmental Reading students were transferred out of the course because they were not motivated by it and thus not progressing at a satisfactory rate.

All students enrolled in the IST Alaska History course are eleventh or twelfth graders. This occurs mostly as a matter of scheduling convenience, but the supervising teacher considers that it works out very well since the reading level of the course is probably too high for most ninth grade students. The students seem to be progressing very well through the course. They move from activity to activity essentially independent of the teacher and rarely need the aide's assistance in the use of the computer.

A good atmosphere for learning exists in the classroom with some students interacting, others working alone, and most everyone going about their business. The supervising teacher observed that when a few students begin to progress more quickly than others, they tend to gradually slow down so that they do not get too far ahead of the rest of the class. All students, therefore, seem to progress at nearly the same rate and most will complete Units I, III, and IV. The teacher stated that this rate of progress is about the rate of the average student in her class.

The IST Alaska History students have the opportunity to work in the course whenever they have some free time, but most students do not work on it outside of class time unless they are in danger of not completing the required number of lessons in a given quarter. The students will then work during study periods and before or after school. Generally, these students do not give the extra effort to progress more rapidly than they are required.

All students enrolled in the IST English course are ninth graders. These students seem to be progressing relatively well through the course, but most seem hesitant to move from activity to activity without getting approval from the supervising teacher or being coaxed by him to do so. This seeming lack of independence in the students disrupts the continuity of the instruction intended in the IST English course, and slows the progress of the students. Precisely why these students lack the desired independence, seen in the Alaska History students, is unclear but several reasons could be hypothesized. One reason may be that the English students are typically two or three years younger than the Alaska History students. These younger students may not be ready or

willing to take on the responsibility of working on their own. A second reason may be the difference in supervising teachers. The English teacher is less experienced than the Alaska History teacher with the IST program and the former is teaching a course outside of his area of expertise. A third reason may be that the switching of teachers in mid-year may have been disruptive for some students. Although it is not certain whether or not the English students worked more independently with the other teacher as their supervising teacher, her comments indicate the students are progressing more slowly under the present teacher. She had a few students who were working in Unit V at the end of the first semester and had hopes that some students would complete the course (12 units) or at least to Unit X. She is not as optimistic now, and indications are that the students will at most complete only about seven units.

The IST English students do most of their work during the 45 minute class period, although several students do work on their worksheets during study hall. Several students spend their class time working on their weekly written assignments, but most students work on them at home. No other IST work seems to be done at home. During the class period, some interaction and competition occurs among the students, but there is very little of it. The supervising teacher doesn't discourage interaction and competition, but he does not openly encourage it either.

All students enrolled in the IST Developmental Reading course are eleventh or twelfth graders. These students were selected from a general English course in which the teacher wanted to individualize instruction based on specific deficiencies. All students in this general English course were diagnostically tested

and grouped according to their needs. Five students were enrolled in the IST Developmental Reading course as a result of this test. These students are progressing very slowly through the course. Two reasons stand out as possible explanations for this slow progress. The first is that the supervising teacher is not available to the students during the class period. She is teaching a Literature class at the same time; consequently, the Developmental Reading students are essentially unsupervised. The aide and the librarian are available to answer student questions, but the students typically seem hesitant to ask any questions. During the 45 minute class periods that were observed, the students seemed to spend one-third to one-half of the time in concentrated work, if they worked at all.

The second reason why these students may be progressing slowly was expressed by the students themselves. During the school's basketball season, the students travel a great deal and miss classes. In a regular class, this missed class time is accounted for by a great deal of homework being assigned to the student to be done while he/she is gone. In the Developmental Reading course, however, no homework was assigned and the students were not sufficiently motivated to do the work on their own. The missed class time was therefore never really made up. This loss of time working in the course and the lack of supervision provided to these students probably contributes to the slow progress of these students through the Developmental Reading course.

The students seemed to feel they have learned something from the IST courses and prefer the IST course format to those of their other courses, but they were not overly enthusiastic. Most stu-

dents like using the computer ("It's fun!"). Others find it frustrating when they cannot achieve the goal of the activity. Reactions to the cassette tapes were mixed: the better students seemed to find the tapes boring, while the slower students found them interesting. The printed course materials were the least preferred by the students. Several students said they preferred the individualized format because in a traditional format, teachers talk too much and are always looking over their shoulders. Finally, the aspect of the IST courses most liked by the Developmental Reading students was the lack of homework.

The issue of no regular homework assignments in the IST courses was a major concern of the part-time principal. He expressed his belief that it is important in a good educational program to have homework, and it is of particular importance at this site. Students tend to miss several consecutive days of school during basketball season and these days are never made up at any later time. Although this situation is a good example of an advantage of the IST courses - the students would not miss lectures and they could pick up where they left off - these students are missing days of contact with the courses. Students in other courses are assigned homework which is due when they return to class. Students in the IST courses generally have no homework and thus do not work on the courses at home nor while they are away on a basketball trip. This lack of homework is a major flaw in the IST courses according to the part-time principal. Several students, although they liked the lack of homework, also made the point that they were progressing very slowly in the IST Developmental Reading course because they did not work in the

course while away playing basketball.

Scheduling and Location of the IST Courses

The IST English course is offered during the first period (45 minutes) each school day in a small classroom about one-half the size of a regular classroom. The students sit at desks arranged in rows with the supervising teacher at his desk in the front of the room. Each class begins with the teacher handing back worksheets and written assignments. Most students seem to wait until this process is completed before getting into their work, a few students do, however, begin their work when they arrive in class, paying very little attention to what else is happening. The cassette tapes, printed course materials, and individual student folders are located in boxes on a desk in a corner of the room. Two cassette tape recorders with headphones are available for student use. The students must go to the resource center, directly across the hall from their classroom, to use the computer. The students go to the computer in the order in which they sign up at the beginning of each class.

The IST Alaska History course is offered during the second period (45 minutes) each school day in a regular classroom (different from the classroom used for IST English). The students sit at neatly arranged tables. The teacher's desk is located in a back corner of the room. Most students begin their work immediately upon arriving in class. A few others need a little encouragement from the supervising teacher to get started, but once started they seem to spend most of the class in concentrated work. The printed materials and individual student folders are located on book shelves near the teacher's desk. The cassette tapes are

located in a file drawer. The cassette tape recorders and headphones are shared with the students enrolled in English and Developmental Reading. There seemed to be no central location for storing this cassette material. The students seem to typically have to look for it at the beginning of each class. It is usually found in the classroom used for IST English or the resource center. The Alaska History students must go to the resource center, directly across the hall from their classroom, to use the computers. When they are ready to use the computer, students ask the supervising teacher's permission and then proceed to the resource center if a computer is available.

Two students could not fit Alaska History into their schedule during the second period. One student works in the resource center on his own during a 45 minute period in the afternoon. The other student works alone in the same room as the other Alaska History students during the supervising teacher's preparation period. The teacher is typically near by if this student needs any help.

The IST Developmental Reading course is offered during the sixth period (45 minutes) each school day in the learning resource center. The students pick up the materials they will need for their work on a particular day from their supervising teacher and take it to the resource center. For the most part, these students are unsupervised. Their supervising teacher is busy teaching a Literature class during this period so she is not available to assist the students. The librarian and the aide provide whatever help the Developmental Reading students need, although these students generally seemed hesitant to ask for it. These students have relatively easy access to the computers since both the stu-

dents and the computers are located in the resource center.

The learning resource center at this site plays a major role in the operation of the IST courses. Two APPLE computers used by the IST students are located in a small isolated corner of the resource center. The diskettes for each student and course, and the necessary written materials are located on shelves along a wall above the computers. All students enrolled in Developmental Reading and one student in Alaska History work in the resource center during their scheduled class period. All other students enrolled in Alaska History and all students in English move back and forth between their classroom and the resource center to use the computers during their scheduled class periods. The aide supervises the students while they use the computers. The librarian stated that the location of the computers in the resource center has not been a distraction, in fact, it has increased the non-IST use of the resource center.

Computer Component

The computers located in the learning resource center are accessible to students and teachers at any time during the school day. The students enrolled in the IST courses use the computers during their class periods, and a few non-IST students work with some MECC programs at other times, but the computers are essentially unused during the remainder of the school day. The part-time principal is very concerned about the efficient use of the computers. He feels they need to be in use all day at the site for their cost to be justified. Expanded use of the computers in the immediate future at this site, however, seems unlikely.

The librarian, presently uses portions of the "With the

Works" text from the IST Developmental Reading course to show students how to use the resource center and will recommend using the entire IST program (including the computer) related to these portions of the text next year. She, however, has no background in the use of the computer and, although interested, has not had or taken the time to become familiar with it. Second-hand reports indicate she is more enthusiastic than most other teachers. These other teachers may be mildly interested, but none feel they have the time to learn about how the use of the computer can enhance their instruction. Unless time is set aside by the administration for the teachers to specifically work with the computer, it seems unlikely computer use will increase. The future effect of this situation may be a decrease, rather than an increase, in the use of IST materials at this site.

Course Content

The supervising teacher with one and one-half years experience using the IST courses has noticed areas of weakness in the IST Alaska History and English courses. She feels the instruction provided in the Alaska History course is very good but her main concern is that the students spend nearly twenty weeks completing Unit I and receive no feedback until the end of the Unit test. She feels the computer activities do not provide sufficient feedback to let the students know how successfully they are mastering the course content. She has constructed several tests to be completed by her Alaska History students as they progress through Unit I, to overcome this deficiency. She considers visual instruction in an Alaska History course important but does not recommend the addition of more visual material as a priority be-

cause she feels there is sufficient visual stimulation, particularly in the Alaska Native books. However, she does supplement the course with numerous pictures and a few films. In addition, she commented that the Unit tests only require the student to recall information. The tests essentially do not require comprehension, application, analysis, or evaluation of the information.

This teacher mentioned two deficiences in the IST English course. The first is the lack of a sufficient emphasis on writing skills. To overcome this, she instituted required written assignments for all students to complete each week in addition to their other IST English work. The present supervising teacher for IST English, has continued to require these written assignments. Student comments suggested that the students enjoy these written assignments, particularly the "pen pal" aspect of them.

The second deficiency in the IST English course is the lack of integration of the course content. The former teacher feels instruction on content is provided in isolation, without much effort to integrate the content into some unified whole. She had attempted to overcome this deficiency by giving lectures at specific points in the course to summarize and tie together the content for the students. She feels these lectures were effective, but the present supervising teacher has not continued them; it is not clear why he discontinued this practice, but it may be due to his lack of expertise in teaching English.

Summary

Three IST courses have been implemented at this site and their operation benefits the school as well as the students. The school is able to offer courses in which they may not have a teach-

er available who has training in the needed content area. The students have greater flexibility in selecting courses for their class schedule. Also, with the great emphasis at this site on extracurricular activities - resulting in extended periods of time away from classes - the IST courses are ideal. Non-IST students miss lectures when they are away from classes, possibly putting these students behind their classmates in learning the course content. IST students, on the other hand, generally have no lectures to miss. The individualized, self-paced nature of the IST course permits these students to progress through the content whether in a classroom or on a basketball trip. Although the computer component of the courses would not be available to the students when they are away from classes, the IST students do not miss coverage of important concepts and information. The multicomponent aspect of the IST courses insures coverage of these important concepts and information in the other (non-computer) components. Although problems have arisen at this site for IST students who have missed class time due to extracurricular activities, the problems could possibly be overcome if the supervising teachers and the students would mutually agree to the completion of a certain amount of work in the courses while away from class. This could possibly minimize the loss of valuable school time for the students and provide some continuity to their learning experience.

The supervising teachers are enthusiastic about the potential uses of IST at this site. In addition to the presently available IST courses, they would like to see made available more specialized courses in academic areas in which too few students have an interest to warrant the scheduling of a regular class. The students

generally expressed a preference for IST-like courses over traditionally conducted courses. The part-time principal is less enthusiastic about the future use of IST at the site. He seemed very concerned about the costs associated with these courses. He also seemed skeptical that students were receiving as good instruction in an IST course as they would in a regular course. His attitude generally seemed to be that IST courses would be used at this site in times of staffing or scheduling problems, but the cost-benefit could not justify their use in a regular classroom setting by a teacher with expertise in the content area. This same part-time principal, however, will be recommending the use of the IST courses at the logging schools in his school district where only one or two teachers are employed. He is satisfied that the cost of implementing these courses in the logging schools would be money well spent.

SUMMARY OF SITE VISITS

Although separated by extreme physical distance, comprised of students with different cultural backgrounds, staffed by professionals who differed in educational background, training, and philosophy, and located in settings very different from each other, the case studies suggested successful implementation of IST. In some cases, aspects of IST required some unique adjustments and flexibility. On the other hand, there were some common characteristics across the sites in the ways that they implemented the IST courses.

Types of Schools Using IST

The schools in this study ranged from very small to relatively large (for rural Alaska). They utilized a range of teaching strategies from individualized instruction to traditional departmentalized secondary programs. Buildings also varied from small modular buildings to modern school structures. In general, a "typical" type of school was not seen in the site visits. Each site setting and physical structure was somewhat unique.

Role of IST in the School

There was some variation of the role IST seemed to play among the schools' programs. At Site I, IST was used to individualize instruction. This fit with the philosophy of the program, but also permitted the teacher more time and flexibility to engage in other classroom activities. At Site II, IST was used as part of a larger program, involving individualized instruction and use of a computer for instruction. At Site III, IST was used when there were too few students in need of a course to warrant offering it in the more usual way. Also it permitted students to be placed in

a program appropriate to their educational needs. At Site IV, IST was used because it permitted more flexibility in class scheduling and eliminated requirements for hiring school personnel not justified by enrollment. In general IST was used to facilitate individualized instruction, provide flexibility and diversity in course offerings and as a cost-effective alternative to traditional methods of instruction.

Acceptance of IST

Although there were differences among administrators and teachers, and variations between courses and course components, IST generally seemed well-received. In some cases it was preferred to what already existed. Its flexibility, and ability to free the teacher to attend to other things was viewed positively. However, there were some specific complaints. For example, other types of courses than those developed were sometimes viewed as deserving higher priority. Packaging problems, courseware problems and dissatisfaction with the audio component were mentioned as concerns.

However, observations indicated that teachers and students were enthusiastic about the courses. Further, the IST equipment and materials were generally used by teachers and students in the ways that were intended.

The Role and Expertise of the Teacher

The role of the supervising teacher varied in accordance with the setting and program at each site. Nevertheless, all teachers were primarily expected to manage learning, maintain records of students' performance and manage the scheduling and operation of the computer. At Site IV record-keeping for all courses was pro-

vided by one teacher who was relieved of some duties to do this task.

Programming and computer maintenance at some sites was assisted by spouses of the supervising teachers. This did not reflect a lack of expertise of these teachers, but rather the collaborative nature of spouse teams at rural sites. An adequate degree of expertise in programmed instruction, and use of computers and technology was shared by all supervising teachers, with only one exception. This one teacher was assigned outside of his area of expertise, in terms of the IST course taught. Most teachers were either certified or had some training in areas they taught.

The Use of Aides

Sites II and IV used aides to assist with IST. Generally, the aide gave assistance where management could not be efficiently provided by the teacher. Nevertheless their roles were different at each site. At Site II the aide's role was primarily clerical. She saw that materials were available, monitored assignments and made sure required work was completed.

At Site IV, where the computer was housed in a separate area, the aide primarily supervised computer use. In addition, she recorded student progress and grades, provided materials and, on occasion, volunteered assistance to students in content areas.

The need for aides appeared dependent on the size of the population, space considerations and the specific needs of the staff and students, as well as the level of expertise of the aide. Generally, there were aides where the teachers had greater responsibility for larger numbers of students, other courses, or equipment.

Location of IST in the School

In Sites I and II all IST materials were stored in the classrooms where the students worked. At Sites III and IV IST students worked in different rooms. At Site IV more than one classroom was used and the computer was housed in a different area.

Differences in location of IST programs, courseware, and materials appeared to reflect the size of the school and the nature of the total program. Thus, four separate patterns were presented each reflecting characteristics of the school rather than differences in philosophy. No single model appeared superior to the others.

When space allocation had to be modified, it appeared to be accomplished efficiently. For example, even when location of IST was outside the classroom at Site IV, the experience of the student in this individualized program was similar to what would have been the case at other sites.

Access to Materials and Computers

Whether or not materials were neatly stored and readily accessible at each site, student ability to locate materials was not a problem.

At Sites I, II, and III, the computer was housed in the classroom; at Site I it was isolated by cabinets; at Site II it was isolated within a learning center and separated from other activities by a relatively large space. At Site III the small space allotted and the central location of the television screen might have been a distraction to other students. At Site IV the computer was housed in a learning resource center outside of the students' classroom. Supervision was provided by the librarian

and the aide, particularly when the Developmental Reading course was scheduled.

Access to the computer was never a problem at any site. Generally, the computer was under-utilized, partially because it was used by IST students during specific periods. Other creative uses of the computer were occurring, such as at Site II where students worked on computer projects. Some sites used the computer for other courses (from MECC, for example).

Recommendations

1. Print materials could be better packaged in hard cover books with perforated pages to be removed and inserted in loose-leaf binders for the students.
2. An alternative form of shipping materials should be developed for schools lacking space and storage areas. A possible design might be strong cardboard or plastic pre-packaged modular storage units, with labeled sections for audio tapes and print materials, similar to a number of commercial packages (i.e., Peabody Language Kits).
3. The teacher's manual should address flexible ways to adapt IST in schools. Some suggested topics for such a manual are: (a) homework using print materials and readings, particularly for students who go away on trips or who may be out of school for more than a brief period, (b) increased use of projects and other activities that permit small group instruction and interaction between students and instructors,

(c) trouble-shooting and other "tips" developed by experienced IST teachers to deal with problematic components and to enhance motivation of students.

4. When an aide is used, specific training for this role is recommended. This would include training in clerical functions, such as record-keeping, grading, monitoring of student progress, and equipment usage.

FINAL REPORT

EVALUATION OF IST COURSES

FY81 PILOT STUDY

PART II - CONTINUED

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SUMMARY AND RECOMMENDATIONS

In general, it can be said that the FY81 pilot study gave a fair test of the implementation of the IST model in rural Alaskan settings. This conclusion is justified for two reasons. First, the students at the sites appeared representative of rural Alaskan students in terms of ASAT scores and other variables. Second, a variety of differences were found across the sites, among them, use of aides, placement of the computer in the school, physical characteristics of the school, philosophy of teaching, and regional and cultural differences. Yet, the IST model remained fairly well-intact, with the individualized nature of the program, the media options, and the course sequences generally maintained throughout.

From the perspective of student motivation, the most significant aspect of the courses seemed to be the sense of independence the student gains in an individualized program, and the motivational quality of the computerized instruction. Students generally felt the computer activities were enjoyable despite the drill-and-practice nature of most of the exercises. Another point relating to student motivation was the lack of group activities. At some sites, particularly predominantly native ones, students tended to become more enthusiastic and lively when they were working in groups. Yet, group activities are not encouraged by the IST model.

Although the students enjoyed working at the computer, there was some evidence from audit trail patterns that they did not know how to utilize feedback about their performance from the computer. This suggests that students would be reluctant to attribute their

learning success to a machine. Yet, of the variables of attribution studied, none predicted success better than the entry skills measured by the ASAT and the pre-course tests. In fact, none of the attribution variables (Second Site Visit Forms 3, 5, 6, 8) correlated substantially with student performance in the present study. Perhaps the emphasis on peer group activities in some of the cultures represented at the rural sites inhibits attribution for success in individualized programs. That is, the individualized nature of the IST program would logically reduce the likelihood that a student would attribute his or her success to a teacher, or other outside influence. Further, using Kleinfeld's (1974) typology of teaching style, there was very little variation among the IST teachers.

Teachers had a favorable attitude toward IST. It seems likely that if the IST programs were not available, either the courses would not have been offered to the students, or the teachers would have had to gather materials and integrate them into courses on their own. Thus, a strength of the IST programs, from the teachers perspective, was that they were already available for use with individuals and small groups of students, and freed the teacher to do other duties.

Teachers seemed to be able to operate IST with the training given. Supervision for students did not go beyond the requirements of other individualized programs. Most teachers, therefore, had no difficulty supervising the courses. However, more training in user-maintenance of hardware probably would have been useful to the supervising teachers at some sites.

There was some evidence that schools should be better pre-

pared for the amount of material and equipment that go with IST. Sufficient open shelf and storage space should be provided, and equipment must be set up with an adequate area for the children to work. Further, the teacher-student ratio seems to depend on the role of the teacher in the school, the availability of an aide, the number of students enrolled, and other characteristics of the educational program and facilities at a local site.

While the courses were generally effective, with a powerful media design, the instructional design seemed lacking in clarity. Further, the best predictors of progress in the courses generally were the skill levels of the students when they began IST study. Finally, revisions to each course are recommended, primarily concerning audio tapes, reading levels, and matching media options to course objective more efficiently.

The IST model seems highly cost effective when compared to the cost of providing individualized instruction to a few students at a rural site by other methods. The courses will become even more cost effective as they become more widely used. This is because of the amortization of development costs over a larger group of students.

In conclusion, the FY81 pilot study suggested that the four course implementation was generally successful in the 25 sites. This report focused on 27 questions related to the students, teachers, settings, courses, and cost of IST implementation. With respect to each question, recommendations were made for continuing or improving the IST courses. A summary of the major recommendations of the site visits and evaluation report follows:

Major Recommendations Regarding:

A. Students

1. An investigation into the reasons for the lack of significant improvement in performance of students in Units II, III, and VI in English should be undertaken.
2. The data suggested emphasis should be on educational diagnostic criteria for placement in IST courses rather than using grade or age criteria.
3. In diagnosing basic skills, mathematics application and reading comprehension tests should be emphasized.
4. The IST students in the rural sites can be considered much like other students in more accessible or larger school settings.
5. A large number of IST students seem to be capable of working independently, at least part of the time, with the course materials. Therefore, this should be emphasized for efficient use of teacher time and incorporated in the teacher-training procedures.
6. Data suggest that IST would be useful in locations where student attendance is irregular or seasonal. Further, it seems worthwhile to apply the IST model to more courses in the future.

B. Teachers

1. The regional supervisor should visit each site early in the school year (October may be a good month) to smooth "rough spots" at each site, anticipate problem areas and offer solutions, and act as a general resource to the IST teacher.

2. A more complete user's manual is recommended. The manual should include guidelines for setting up the classroom, administering the course, motivating students, alternating sequences of activities, managing student learning, and record-keeping. In addition to the hardware information already included, trouble-shooting techniques for teachers should be given.
3. Training meetings for teachers and school personnel are recommended to be held three times a year. In the Spring Workshop, administrators and teachers would be familiarized with the courses, ordering information, etc.. The Late Summer Workshop would be attended by new IST teachers and experienced ones who wish to have a review of organizing, managing and administering IST courses. A Mid-Year Workshop would include seminars on new products, simple maintenance, exchanging information, and feedback to DOE.
4. The IST supervising teacher should be physically present in the same location as the students working on the course materials.
5. The ratio of students to teacher does not seem to be critical within certain limits. However, as a general guideline, it is recommended that seven IST students per teacher (or aide) per course be considered a full load for an IST teacher. Further, this can be adjusted up or down depending on the role of the teacher at the site, the presence of an aide, and other considerations.
6. Teachers should permit students the freedom to become

familiar with the routine of the IST courses, so that they (the students) can become relatively self-sufficient in the learning process.

7. Teachers who felt better prepared to handle classrooms in which several different kinds of activities were going on simultaneously, and those who reported prior experience with audio tapes seemed to obtain better post-course test performance from their students. Therefore, classroom management training for individualizing education, functioning within a classroom in which diverse activities in large and small groups are going on, and attention to classroom use of audio tapes should be parts of the pre-service training for IST teachers.
8. When an aide is used, specific training for this role is recommended. This would include training in clerical functions, such as record-keeping, grading, monitoring of student progress and equipment usage.

C. Setting

1. The criteria for selecting schools to participate in the FY81 pilot study should be part of the bases for recommending the courses for wider usage.
2. Local sites should be given realistic estimates of the number of items to be stored and the storage space required for IST. Also, they should be given guidelines for storage of delicate materials (i.e., warnings about storing diskettes near television screens, or allowing diskettes to bend or get wet).
3. There should be some form of back-up system in local

districts to replace hardware when it is malfunctioning until it is repaired.

D. Courses

1. The sequence of instruction in the Alaska History course may require revision. Consideration should be given to placing Unit II later in the course, perhaps to come after the present Unit IV.
2. For courses in which reading comprehension is an important prerequisite (see Final Audit Trail Report, Smith & Gohs), supplementary audio learning experiences and "mathematical-logical" teaching methods and computer graphics should be employed for the benefit of students with poor reading comprehension skills.
3. The media options should not be reduced in future planning for IST, however, visuals should be added. This does not necessarily require expensive video tapes or films be created. Visuals can also include cartoons, pictures, maps, charts, and other less expensive options.
4. The question of how much of a course must be completed for credit to be awarded may be a general problem in Alaska, and not just specific to IST. If there are generally recognized standards for curricula, IST courses need only be compared to them. Without such standards, however, DOE should offer some guidance in this area.
5. Since much instruction in academic subjects is cumulative, and is based on students attainment of prior skill and knowledge, some guidance should be given about the lessons/activities/units that are most essential for com-

pletion by students if they are to study more advanced topics.

6. All four courses were viewed as integrated to some degree. However, when they are revised, the courses should be carefully reviewed to insure that all of the components support the objectives.

7. Some decision should be made about how long students work on an instructional activity. Further, some consideration should be given to the type of activity and the media option employed in a lesson. For example, a student may only be able to perform a computer drill for about 10 minutes with some effectiveness. On the other hand, a "hands-on" learning project might usefully occupy a student for 40 minutes or more.

8. DOE should review points on integration covered in the Mast Report (ESD, 1980). It is not uncommon for an activity to confuse the student by presenting competing or inappropriate tasks or media options. For example, pictorial images are fostered by tapes or readings in places where the presentation of pictures would have been more effective.

9. The audio tapes should be revised to make them more interesting since the evaluation data suggest they are effective teaching aids, particularly for students who are relatively less skilled readers. Increasing the interactive nature of the tapes, adding pictures to student materials to illustrate what is being said on the tapes, and paying more attention to training teachers in the use

of audio tapes are suggested ways of making the audio component more accepted.

10. The importance of entry math skills to performance in the English course and entry reading skills to performance in Alaska History should be investigated. It may be that a large number of rural students do not have the requisite skills to begin these programs and perform successfully. Thus, revision, amendment or addition of activities for students with lower levels of basic skills might be appropriate.

11. It might be worthwhile to integrate media options more. For example, a student might be told to listen to an audio tape by the computer. The tape would tell the student to find things in some pictures or a story, and type them into the Apple II to solve a problem in an activity. This kind of integration of media might lead to better attention rates and more learning.

12. Each course should be reviewed for readability of the materials. In every course, but particularly Alaska History, some printed materials are too difficult. The readability of materials should be no higher than about 7th to 8th grade level. Until adjustments can be made, it might make the courses more effective at some sites if they were used with older students, or those who score well on standardized reading tests.

13. Although the IST model seems to be reasonably well accepted, the level of acceptance does not appear to be uniform for all courses and components. Therefore,

teachers might be surveyed to determine whether components and courses they rated as less preferred were so rated because of less need for them, or because of design problems, classroom management problems, student acceptance, or other influences.

14. Revision and up-date of courses should include consideration of teacher and student comments and preferences regarding the courses and their components.
15. In the revision of the IST computer component, more kinds of options for adaptive instructive and HELP frames should be provided. These should be designed to be response-guided. That is, when a student provides a correct response, the computer will automatically go to a higher level similar activity, or move on to a completely new activity. A wrong response would trigger a HELP frame appropriate for the kind of error the response represents.
16. Greater use should be made of graphic capabilities of the Apple II computer.
17. The interactive nature of instructional frames should be emphasized.
18. Efforts should be made to reduce the importance of the supervisory disk. In addition to adding considerable wear-and-tear to disk drives, the supervisory component of the computer course had the greatest maintenance and operational problems in the system during FY81. Further, one less disk drive would render the hardware less expensive for the local district to purchase.
19. Print materials might be better packaged in hard cover

books with perforated pages to be removed and inserted in binders for the students.

20. An alternative form of shipping materials should be developed for schools lacking space and storage areas.
21. A manual of information could be developed for administrators and supervising teachers giving guidelines on implementing IST. Among other things, desirable teacher-student ratios could be discussed under various kinds of settings (i.e., large school, small school, aide present, one or several courses operating, several teachers involved, etc.).
22. Guidelines for teacher-student ratio under various settings should be included with the ordering materials that are sent to administrators.
23. The IST teacher guides should contain suggestions for organizing the classroom and placing hardware in the most advantageous places.
24. The teacher's manual should address flexible ways to adapt IST, such as: 1) the development of homework assignments using print materials and readings, particularly for students who are away on trips or who may be out of school for more than a brief period; 2) increased use of projects and other activities that permit small group instruction and interaction between students and instructors; 3) trouble-shooting ideas and other "tips" developed by experienced IST teachers.
25. Another aspect to consider in the courses is cognitive level being addressed by instruction objectives, activ-

ities, and tests. In many cases, higher-order cognitive skills are called for in the objectives, but are not present in the instruction. For example, an objective requiring the student "to describe" is accomplished through a series of "analysis" activities. The student is then asked to "identify" on the test. This is common in all four courses.

26. Greater emphasis on higher level cognitive patterns should be built into the courses in general, but the computer exercises especiallly. The instructional model should be further developed (NWREL IST Design Report), to better integrate cognitive levels into media selection, course design, and objective specification.

27. Implementing many of the recommendations for IST course improvement in this evaluation will require a more adequate instructional design be constructed. It is recommended that a cognitive information-processing model be used as a basis since this would be very compatible with computerized instruction. Further, for the affective and motivation aspects, a causal attribution approach might be utilized.

28. The development of an instructional model should take into consideration existing IST materials and programs and the culture of the rural Alaska students to whom the courses are directed.

29. The instructional design should specify the purposes for use of each media option. Further, it should include a guide for the curriculum designer to insure correspondence

between objectives, learning processes, learning outcomes, and selected media options.

30. Two things should be clear from the above recommendations regarding the four courses implemented during the FY81 pilot study:

    1) The four IST courses achieved some measure of success.

    2) The four IST courses are in need of revision, improvement, and up-grading.

E. Costs

1. The IST courses would be cost-effective when they are used by a large number of students. Therefore, it is recommended that publicity efforts be concentrated on enrolling as many students as can be effectively managed from rural sites.

2. A small study of learner-efficiency might be conducted which would compare students learning a particular set of objectives in IST and in other course materials. Although present data are convincing that the IST model is cost-effective from an economy-of-funds perspective, there is no real evidence that learning is differentially effected by the model. This question should be balanced against cost. It may very well be that IST results in better learning as well as being cheaper for rural districts to operate.

3. DOE should investigate alternative models of teacher training to reduce costs. Some ideas that might be worth investigating are:

a) Use of the Electronic Mail System (EMS);

b) Use of local site people as resources;

c) Several small regional training sessions rather than a couple of large ones in Anchorage, Juneau, and/or Fairbanks;

d) Better use of teacher guides;

e) A "hot line" through EMS or the phone system for trouble-shooting.

f) Development of a training package including instructional diskettes that use the power of the computer to train teachers in its use. This could be done through traditional computer literacy packages plus specific audio and printed materials developed for IST.

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APPENDIX A

For Tables A.6 to A.10:

1. % Gain=Mean Difference/(1.00-Pre-Course Mean %)

2. * $P \leq .05$
   ** $P \leq .01$
   *** $P \leq .001$

TABLE A.1

ALASKA STATEWIDE ACHIEVEMENT TEST (ASAT)

SUMMARY STATISTICS

SUBTESTS	ALL IST STUDENTS	STUDENTS ENROLLED IN ALASKA HISTORY	ENGLISH	DEVELOPMENTAL READING	GENERAL MATH
Math Computation (Perfect Score = 36)					
Mean*	18.4	19.5	16.4	18.0	16.3
Std. Dev.	7.5	7.5	7.0	7.2	6.7
N	291	71	60	107	110
Math Application (Perfect Score = 66)					
Mean*	32.6	35.0	32.0	32.0	30.1
Std. Dev.	11.2	12.7	10.6	10.1	11.1
N	290	71	60	107	110
Reading Comprehension (Perfect Score = 45)					
Mean*	23.5	24.6	23.1	23.1	22.1
Std. Dev.	8.4	9.3	7.7	8.0	8.0
N	285	69	59	107	101
Reading Word Identification (Perfect Score = 39)					
Mean*	28.1	29.5	27.2	28.2	26.3
Std. Dev.	7.1	6.2	6.9	7.2	7.3
N	275	61	59	104	95

*Number of questions answered correctly

TABLE A.2

ALASKA HISTORY PRE-COURSE TEST SUMMARY STATISTICS

UNIT	NO. OF STUDENTS	PERFECT SCORE	MEAN	STANDARD DEVIATION	MIN	MAX
I	75	4	1.77	1.37	0	4
II	75	4	0.99	0.76	0	3
III	75	8	2.08	1.51	0	8
IV	75	4	1.43	1.04	0	4
V	75	4	2.09	1.02	0	4
OVERALL	75	24	8.36	3.34	1	16

TABLE A.3

ENGLISH PRE-COURSE TEST SUMMARY STATISTICS

UNIT	NO. OF STUDENTS	PERFECT SCORE	MEAN	STANDARD DEVIATION	MIN	MAX
I	61	7	4.11	1.71	0	7
II	61	3	2.48	0.85	0	3
III	61	3	1.59	0.64	0	3
IV	61	3	1.70	0.80	0	3
V	61	3	1.74	0.83	0	3
VI	61	3	1.54	0.74	0	3
SEMESTER I:	61	22	13.16	3.50	3	20
VII	61	3	1.23	0.82	0	3
VIII	61	3	1.44	0.81	0	3
IX	61	3	2.28	0.73	0	3
X	61	3	1.26	1.05	0	3
XI	61	3	1.13	0.64	0	3
XII	61	8	2.67	1.42	0	6
SEMESTER II:	61	23	10.02	3.20	3	18
OVERALL	61	45	23.18	5.65	9	33

TABLE A.4

DEVELOPMENTAL READING PRE-COURSE TEST SUMMARY STATISTICS

SUBTESTS	NO. OF STUDENTS	PERFECT SCORE	MEAN	STANDARD DEVIATION	MIN	MAX
WORD IDENTIFICATION	107	10	7.62	2.12	3	10
COMPREHENSION	107	40	17.81	5.66	2	36
STUDY AND RESEARCH	104	40	23.49	7.89	5	38
LITERARY UNDERSTANDING AND APPRECIATION	104	10	3.79	2.51	0	10
OVERALL	104	100	52.75	15.00	15	89

TABLE A.5

GENERAL MATH PRE-COURSE TEST SUMMARY STATISTICS

CHAPTER	NO. OF STUDENTS	PERFECT SCORE	MEAN	STANDARD DEVIATION	MIN	MAX
I	99	12	7.95	1.81	2	12
II	99	7	4.14	1.52	1	7
III	99	7	2.53	1.57	0	6
IV	96	9	3.77	2.11	0	8
SEMESTER I:	87	35	18.34	5.13	7	31
V	90	8	2.48	1.75	0	6
VI	90	7	1.77	1.41	0	5
VII	90	7	1.36	1.41	0	6
VIII	87	8	2.86	2.04	0	7
IX	87	5	1.63	1.17	0	4
SEMESTER II:	87	35	10.13	5.41	0	23
OVERALL	87	70	28.47	8.89	9	52

TABLE A.6

ALASKA HISTORY PRE-COURSE AND POST-COURSE

PAPER-AND-PENCIL TESTS SUMMARY STATISTICS

UNIT	NO. OF ITEMS	NO. OF STUDENTS	PRE-COURSE MEAN %	POST-COURSE MEAN %	MEAN % DIFFERENCE	% GAIN	t-VALUE
I	4	43	44.2	71.5	27.3	48.9	5.14***
II	4	43	26.2	35.0	8.8	11.9	1.83
III	8	43	28.8	51.5	22.7	31.8	5.97***
IV	4	43	37.8	46.5	8.7	14.1	1.83
V	4	43	52.2	64.5	12.3	25.7	2.97**
OVERALL	24	43	36.3	53.4	17.1	26.8	8.03***

TABLE A.7

ENGLISH PRE-COURSE AND POST-COURSE

PAPER-AND-PENCIL TESTS SUMMARY STATISTICS

UNIT	NO. OF ITEMS	NO. OF STUDENTS	PRE-COURSE MEAN %	POST-COURSE MEAN %	MEAN % DIFFERENCE	% GAIN	t-VALUE
I	7	43	59.9	77.7	17.8	44.8	3.87***
II	3	43	79.0	80.0	1.0	3.2	0.20
III	3	43	53.3	52.6	-0.7	-1.4	-0.18
IV	3	43	58.0	69.0	11.0	26.2	2.39*
V	3	43	57.3	77.7	20.4	46.9	4.05***
VI	3	43	53.3	57.3	4.0	8.6	0.90
SEMESTER 1:	22	43	60.1	70.6	10.5	26.2	5.01***
VII	3	43	41.0	33.3	-7.7	-13.0	-2.23*
VIII	3	43	45.0	58.0	13.0	24.2	2.52*
IX	3	43	78.3	76.7	-1.6	-7.7	-0.42
X	3	43	45.7	51.0	5.3	9.8	1.10
XI	3	43	38.0	37.3	-0.7	-1.1	-0.21
XII	8	43	32.0	45.0	13.0	19.3	4.00***
SEMESTER 2:	23	43	43.5	49.1	5.6	10.0	3.23**
OVERALL	45	43	51.6	59.6	8.0	16.5	6.34***

TABLE A.8

DEVELOPMENTAL READING PRE-COURSE AND POST-COURSE

PAPER-AND-PENCIL TESTS SUMMARY STATISTICS

SUBTEST	NO. OF ITEMS	NO. OF STUDENTS	PRE-COURSE MEAN %	POST-COURSE MEAN %	MEAN % DIFFERENCE	% GAIN	t-VALUE
WORD IDENTIFICATION	55	10	77.8	85.5	7.7	34.2	3.17**
COMPREHENSION	55	40	46.4	55.6	9.2	17.2	4.66***
STUDY & RESEARCH	52	40	60.7	72.2	11.5	29.3	6.31***
LITERARY UNDERSTANDING & APPRECIATION	52	10	41.0	57.3	16.3	27.6	4.53***
OVERALL	52	100	54.8	64.9	10.1	22.4	7.06***

TABLE A.9

GENERAL MATH PRE-COURSE AND POST-COURSE

PAPER-AND-PENCIL TESTS SUMMARY STATISTICS

CHAPTER	NO. OF ITEMS	NO. OF STUDENTS	PRE-COURSE MEAN %	POST-COURSE MEAN %	MEAN % DIFFERENCE	% GAIN	t-VALUE
I	12	77	65.9	70.6	4.7	13.7	2.13*
II	7	77	58.4	64.4	6.0	14.4	2.24*
III	7	77	35.3	50.3	15.0	23.2	4.81***
IV	9	74	39.3	48.8	9.5	15.6	3.05**
SEMESTER 1:	35	74	51.7	59.3	7.6	15.7	4.27***
V	8	68	29.8	36.0	6.2	8.9	1.69
VI	7	68	24.9	27.7	2.8	4.0	0.90
VII	7	68	17.9	20.4	2.5	3.1	0.80
VIII	8	65	32.2	32.1	-0.1	-0.4	-0.05
IX	5	65	31.4	30.8	-0.6	-0.9	-0.17
SEMESTER 2:	35	65	27.3	29.7	2.4	3.3	1.08
OVERALL	70	65	39.2	44.6	5.4	8.9	3.67***

TABLE A.10

CORRELATIONS OF PRE-COURSE TEST SCORES

WITH POST-COURSE TEST SCORES, AND FIRST ORDER PARTIAL

CORRELATIONS OF ASAT SUBTEST SCORES, AGE, AND

GRADE LEVEL WITH POST-COURSE TEST SCORES WITH

PRE-COURSE TEST SCORES PARTIALED OUT

	POST-COURSE TEST			
	HISTORY	ENGLISH	DEVELOPMENTAL READING	GENERAL MATH
ZERO-ORDER CORRELATIONS WITH PRE-COURSE TESTS	.698***	.823***	.797***	.600***
First-order Partial Correlations with Pre-Course Test Scores Partialed Out				
ASAT+ Subtests				
Math Computation	.356*	.265	.172	.321*
Math Application	.472**	.567***	.406**	.394**
Reading Comprehension	.446**	.574***	.005	.335*
Reading Word Identification	.312	.425**	-.065	.401**
Age	-.064	.079	-.206	-.004
Grade Level	-.047	.022	-.182	-.058

+ ASAT = Alaska Statewide Achievement Test

APPENDIX B

Instruments 1 through 8

of

The Second Site Visit Forms

Responses recorded on the eight Second Site Visit instruments provided information on:

1. Characteristics of the school and implementation of the IST courses at the evaluation sites;
2. The operation and maintenance of the hardware and software at the evaluation sites;
3. Observations of IST teachers' and students' classroom behavior;
4. Characteristics of the community in which IST has been implemented;
5. IST students' attitudes towards self and school;
6. IST students' attitudes towards the IST courses;
7. General characteristics of the IST students; and
8. IST teachers' attitudes towards the IST courses.

This information was collected on 25 IST evaluation sites, 37 IST supervising teachers and 49 randomly selected IST students (2 students from each of 24 sites and 1 student from the 25th site).

The numbers indicated on each instrument specify either:

1. The frequency of the responses for each alternative to a question where appropriate;
2. The mean response and range where appropriate (each mean is recorded to one decimal place);
3. The ranking of the alternatives where appropriate; or
4. The most frequent responses to the fill-in questions.

Instrument 1 OBSERVATIONS OF IST SITE

Supervising Teacher:_____ Site:_____

Site Visitor:_____ Date:_____

Part I

Date school opened for classes:_____

1. Kind of school (check one):

11	K-12	3	Junior High and High School (7-12)
5	High School	0	Junior High only (7-9)
0	Middle and Secondary (6-12)	5	Other:_____

2. Total number of students in school: 62.8 (range: 7 - 189)

   a) Total number of students in 8th grade: 6.3 (range: 0 - 22)

   b) Total number of students in 9th grade: 7.7 (range: 0 - 20)

   c) Total number of students in 10th grade: 7.6 (range: 0 - 23)

3. Check the physical characteristics of the room in which IST courses are conducted that are considered problem areas, or that are less than adequate.

0	Lighting	5	Space allocated
4	Heating and air conditioning		
0	Decoration to make room seem more interesting		
5	Noise (describe briefly):_____		
0	Furniture (describe briefly):_____		

4. Is there someone in charge of the IST courseware besides the Supervising Teacher?

8	Yes	17	No

If yes, check each of the following that this applies to (for each course).

		History	English	Math	Reading
____	Computers and diskettes	2	2	3	3
____	Printed materials	2	2	4	3
____	Audio tapes and players	2	2	4	3
____	Texts and supplementary materials	2	2	4	3

5. Is there an aide, parent, or assisting teacher assigned to help the Supervising Teacher with IST?

__3__ Yes, a paid full-time aide

__6__ Yes, a paid part-time aide

__0__ Yes, a parent or unpaid aide

__0__ Yes, (other)_____

__15__ No

6. Official start-up date:_____

7. In this community, is it likely that a child's parents will have completed high school?

__7__ Yes, very likely for both parents

__5__ Very likely only for one parent

__13__ No, not likely for both parents

Part II

Observations of IST in a school day

1. How many students were typically using (write number or zero in spaces):

   a) Written and workbook materials 4.1 (range: 0 - 21)

   b) Audio tapes 1.1 (range: 0 - 5)

   c) Computer exercises 2.3 (range: 0 - 10)

2. Were students using IST materials in ways that were different from those intended? (i.e. listening to popular music on the cassette recorders, taking units out of sequence, using parts of courses, etc.)

   2 Yes 17 No

   Explain: _____

   _____

3. Were teachers using the IST materials in ways that were not intended by the designers? (Check as many as appropriate)

   0 Yes, mixing materials from other courses

   0 Yes, using materials on group rather than individual basis

   0 Yes, only using parts of courses or lessons

   2 Yes, taking lessons out of sequence

   1 Yes, using IST courseware as secondary materials to supplement other curriculum materials or programs

   1 Yes, but not one of the above (explain): _____

   _____

   15 No

4. If the answer was "yes" to C, which IST course(s) were being used in these "nonstandard" ways. (Check as many as appropriate)

   0 Alaska History 0 English

   2 Math 1 Reading

5. Typical number of students working on IST at one time:

   0 One 6 Three

   4 Two 8 Four or more

6. How do students interact with each other while working on IST?

__9__ Not at all on any of it

__1__ Only on computer exercises

__4__ Only on workbook exercises or activities

__0__ Only on tape exercises

__5__ Other (explain):_____

7. How smoothly is the teacher able to manage IST?

__1__ The IST courses seem to be difficult for the teacher to manage and there are great problems getting all of the supervisory functions completed at this site.

__1__ The IST courses seem to be difficult for the teacher to manage but everything seems to be getting done.

__7__ The IST courses do not seem to be particularly difficult for this teacher.

__10__ The IST courses are managed smoothly and without difficulty by this teacher.

8. How many Apples are there in the school that are available for IST students to use? 1 in 14 schools; 2 in 6 schools; no response from 5 schools.

9. Does the IST supervising teacher have other responsibilities which occupy them simultaneously when their IST students are working?

__4__ No

__1__ Yes, teaches another class at the same time in another room

__4__ Yes, teaches another class at the same time in the same room

__7__ Yes, works with other students individually or in small groups

__1__ Yes, operates the library or provides other services (i.e._____) at the same time

__2__ Yes, other (explain):_____

Instrument 2 OPERATION AND MAINTENANCE OF HARDWARE AND SOFTWARE

Supervising Teacher:_____ Site:_____

Site Visitor:_____ Date:_____

For the following, the regional supervisor should check whether any of the following hardware and software are problem areas. Place a check in the column labelled "Problem" when that item has raised some difficulty between start-up and the present site visit. In the next column, indicate the time in which IST or some part(s) of it could not be used by students while awaiting repair or solution. Also note comments as necessary. Where necessary, obtain the information from the supervising teacher.

	Check if problem since start-up	Time waited for repair or solution (DAYS)	Comments (RANGE)
A. Hardware (Apple II)			
1) Malfunctions	12	23.0	(3 to 31)
2) Power outages or inadequacies	6	25.0	(14 to 35)
3) Obtaining help with problem equip.	3	29.5	(28 to 31)
4) Training on equipment	0	-	-
5) Temperature control in room containing Apples	5	-	-
6) Security at IST room	1	-	-
7) Computer problems	3	33.5	(7 to 60)
8) Students have ready access as needed	0	-	-
9) Staff has ready access as needed	0	-	-
10) Disc Drive malfunction	4	62.5	(5 to 120)
11) Monitor malfunction	0	-	-
12) Cables between components malfunction	4	10.5	(7 to 14)
13) Other (describe) _____	7	19.0	(7 to 31)
B. Software and Diskettes			
1) Program diskettes containing errors	14	29.2	(1 to 120)
2) Delays in receiving diskettes by mail	1	7.0	(7 to 7)
3) Supervisory diskettes malfunction	9	43.8	(4 to 180)

	Check if problem since start-up	Time waited for repair or solution (DAYS)	Comments (RANGE)
B. Softwear and Diskettes (Con't)			
4) Defective or damaged diskettes	8	36.8	(3 to 120)
5) Availability of diskette resupply	6	120.0	(120 to 120)
6) Other (describe) _____	1	-	-
C. Support Functions			
1) Late delivery	4	81.0	(42 to 120)
2) Shortages in delivery	3	28.0	(28 to 28)
3) Resupply (i.e. diskettes)	0	-	-
4) Instruction manual	1	-	-
5) Questions for regional supervisor	4	14.0	(14 to 14)
6) Ordering problems	3	59.3	(21 to 112)
7) Other (explain) _____	4	3.0	(3 to 3)

ADDITIONAL COMMENTS:

Instrument 3 CLASSROOM OBSERVATION SCALE

Supervising Teacher:_____ Site:_____

Site Visitor:_____ Date:_____

Amount of time in class:_____

Names of IST students present during observation (additional on back).

An average of 6.6 students present during observations (range: 1 - 17)

Instructions:

This instrument was designed to rate teacher and student behaviors. To use this instrument, raters should be thoroughly familiar with all items before visiting the classroom. The instrument should be completed away from the site shortly after departure. It is important that ratings not be made in the classroom because of the uneasiness that could result. Further, it is important to be able to recall the behaviors to be rated with as high a degree of accuracy as possible.

Use the following rating scale to make your ratings of each statement. Please keep in mind that we are interested in the kind of relationship IST teachers have with their students, not the traditional teacher. Therefore, think of these items in terms of the IST setting.

Rate the following 16 questions about classroom behavior according to the scale below:

1. Never observed

2. Only rarely observed

3. Occasionally observed

4. Observed fairly often

5. Observed very often

Use the appropriate number to represent a category of rating. Ratings should be marked in the space to the left of the item. The Comments section appearing at the end of each item may be used to clarify the meaning of a rating when you feel it is necessary.

Rating	Item
4.6	1. The teacher relates to the students in a friendly manner characterized by informality in communication and flexibility in his or her physical position in the classroom in relation to where the students are and what the students are engaged in doing.
	Comments:_____
2.0	2. The teacher's requirements for the students completing their work seem based on low academic expectations and their is a lack of firmness and consistancy in academic demands.
	Comments:_____
3.8	3. When the students have to explain their work or answer questions posed to them by the teacher, they appear relaxed, spontaneous and alert.
	Comments:_____
2.6	4. The students appear lethargic and disinterested in class activities.
	Comments:_____

1.4 5. The teacher relates to the students in an impersonal and informal way characterized by a stern demeanor, use of authority and a fixed physical position in the classroom such as at or near the desk, or in the front of the room.

Comments:_____

_____

3.7 6. The teacher's academic requirements seem based on high academic expectations, and are communicated in a firm and consistent manner.

Comments:_____

_____

1.9 7. When the students are talked to by the teacher in large or small groups or individually, they seem to become humiliated, embarrassed, tense or rigid, or they withdraw into silence.

Comments:_____

_____

4.0 8. The students are generally occupied and involved with activities and appear active and busy.

Comments:_____

_____

4.2 9. The teacher communicates to the students with enthusiasm, often smiles and stays in close physical proximity to them.

Comments:_____

_____

2.0 10. The teacher responds with disregard of students' responses and the students are allowed to evade the required behavior or the teacher is permissive.

Comments:_____

_____

3.9 11. The students have free access to teachers and materials and students work together cooperatively: sharing, comparing and frequently smiling.

Comments:_____

_____

2.6 12. The students' eyes are not focused on materials or when they are, they do not appear to be paying attention to them, or they are looking away from materials and/or teacher.

Comments:_____

_____

1.6 13. The teacher communicates to the students in a flat tone, with little emotion, never smiles and is usually some physical distance from the students.

Comments:_____

_____

3.8 14. The teacher's academic requirements are made with awareness of student's responsiveness to demands, but the teacher permits no evasiveness or avoidance of tasks.

Comments:_____

_____

1.8 15. The students work at fixed seating positions, requiring permission for access to equipment and the teacher; they work in relative isolation from each other and rarely smile.

Comments:_____

_____

2.9 16. The students have an active, intense look and keep their eyes focused on materials, and their bodies in an alert posture.

Comments:_____

_____

Instrument 4 COMMUNITY CHARACTERISTICS

Supervising Teacher:_____ Site:_____

Site Visitor:_____ Date:_____

This section should be completed by the regional supervisor interviewing someone outside of IST, preferably a parent or official of the community who might be well-enough informed to provide the necessary answers.

Informant (Name and position in community):_____

_____

1. Estimated total population of community: 337.4 (range: 93 - 950)

2. Native group affiliation that is predominant (if any): Eskimo (11); Tlingit (4); Athabascan (4); Aleut (2); Non-native (1).

3. The major economic base (or source of employment) for the community:

2	Tourism	18	Fishing	0	Mining
4	Forestry	9	Hunting	0	Oil
21	Other (list): Trapping (4), School (3), Construction (3)				

4. What are the functions of your school in this community? (Check all which apply)

17	For education of the young only	11	Community Center
11	A major part of community life	0	Local administration (i.e., courts, community offices, etc.)
8	Other (specify):_____		

5. Who began the school and who runs it today? (Put B for began, and R for runs)

10B(OR)	BIA	0B(OR)	Mission	1B(9R)	REAA
7B(15R)	Local Districts	5B(OR)	Other (specify):_____		

6. What do you consider the major contribution of education to the children in your community?

Education enables them to:

12	learn how to read and write	5	get a good job
8	assist the community	9	go to college
8	learn a skilled trade		
6	Other (specify):_____		

Instrument 5 STUDENT QUESTIONNAIRE

Supervising Teacher:_____ Site:_____

Site Visitor:_____ Date:_____

Student:_____

Part I

The examiner administers this in an interview with a selected student.

Examiner says:

"I would like to know what you think about when you get high and low grades on tests in school. For example, there are many reasons that boys and girls give when they get a high grade. They might say it was because they were good in class or that they tried hard or they had good luck on the test. They might also say it was because the test was easy or because they had a good teacher or because of the IST courses."

Then say the following to the student:

"Suppose you take a test and receive a high grade. There could be many reasons why you did so well. Some of these reasons could be: your ability, your effort, good luck, the test was easy, you were prepared for the test, you were interested in the subject and so on. Some of these reasons may or may not have been important to you. Look at this list. (The student is handed a copy of the list from the following page.) If you think any of these things was really important, call it a "5" for very important. If it was important, but not the major reason why you think you did well, call it a "4". If it had hardly anything to do with how well you did call it a "3". It it had almost nothing to do with your grade, call it a "2", and if it definitely had nothing at all to do with your grade, call it a "1".

Rehearse the rating scale with the student until you are sure he/she understands the different reasons and how to assign numerical ratings to them. The, with the student rating sheet in front of the student, read each of the reasons, ask the student to assign a number, and then query their understanding of the meaning of each reason and the number for the rating.

Rating #1 (High Grade)

For the first rating, read the following question to the student:

"When you receive a high grade on a test, usually, how important is each of these?"

Read the reasons and not the number for each that the student answers. Also note any comments you think are pertinent to the student's responses.

Rating #2 (Low Grade)

Repeat the procedure used with the first rating after reading the following question:

"When you receive a low grade on a test, usually, how important is each of these?"

SCALE

1 - Nothing to do with my receiving the grade.

2 - Almost nothing to do with my receiving the grade.

3 - Some importance in my receiving the grade.

4 - Important in my receiving the grade.

5 - Very important in my receiving the grade.

Reasons	Rating #1	Rating #2
1. My ability	4.0	2.8
2. My effort	4.0	3.4
3. Good luck	2.4	2.1
4. The level of difficulty of the test.	3.6	3.5
5. My preparedness to take the test.	3.9	3.3
6. My interest in the subject.	3.7	3.3
7. My teacher's wishes.	3.1	2.3
8. My parent's wishes.	3.7	2.4
9. IST projects	3.5	2.6
10. IST Workbook material	3.8	2.8
11. IST Computer exercises	4.0	2.9
12. IST Audio tapes	3.2	2.5
13. IST Outside readings	3.2	3.0

Part II

1. What do you like most about school?

Non-academic subjects, particularly Phys. Ed. and Shop, Sports, and Social Activities.

2. What do you like least about school?

English, Math, Science, History, and Homework

3. Why should you do what your teacher wants you to do in school?

Because he or she:

13 a. is smart and I can learn a lot.

7 b. is nice and I like to do things for him (her).

19 c. is the teacher.

8 d. is nice to me if I try hard and am smart.

1 e. punishes me if I don't try hard and am not smart.

4. What do you consider to be the best reason for going to school and obtaining an education?

29 a. To be able to get a job.

4 b. To be able to do those things my community needs me for.

12 c. To be able to go to college.

0 d. It has no value to me.

3 e. Other (specify):_____

5. When I approach a new assignment in school, I:

15 a. expect to do it well and get a high grade.

31 b. try to do it well, but do not always get a high grade.

1 c. do not try especially hard because I do not get good grades often.

1 d. do not expect to do well and expect to get a low grade.

Instrument 6 STUDENT COURSE EVALUATION

Supervising Teacher:_____ Site:_____

Site Visitor:_____ Date:_____

Student:_____

This is to be administered to the child as an interview by the regional supervisor or supervising teacher.

Fill in response to item 1, then check the appropriate choice for items 2 through 9.

1. IST course(s) student is taking: ALASKA HISTORY (8 Students)

2. When I am doing my IST courses, I:

   3 a. almost always understand what needs to be done, and can work by myself.

   5 b. sometimes do not understand what needs to be done and need my teacher's help.

   0 c. usually do not know what to do and ask for the teacher's help.

   0 d. never can figure out what to do and wait for the teacher to show me.

3. When I am working on IST exercises:

   5 a. I finish the lesson and work at my own speed.

   0 b. I finish the lesson but have to hurry.

   0 c. I work at my own speed but usually do not finish the lesson.

   0 d. I usually hurry, but still do not always finish.

4. Computer exercises in the IST courses are:

   4 a. very interesting 0 d. not interesting

   4 b. somewhat interesting 0 e. not at all interesting, boring

   0 c. a little interesting

5. Audio tape programs in the IST courses are:

   1 a. very interesting 1 d. not interesting

   3 b. somewhat interesting 2 e. not at all interesting, boring

   1 c. a little interesting

6. Reading and written work in the IST courses are:

0	a.	very interesting	0	d.	not interesting
4	b.	somewhat interesting	0	e.	not at all interesting, boring
4	c.	a little interesting			

7. I think the IST courses that I do are:

0	a.	too easy	1	d.	a little too hard
2	b.	easy but not too easy	0	e.	very difficult
5	c.	just about right			

8. If I had my choice about how I would like to learn in school, I would prefer to learn from (check no more than 3):

7	a.	computer exercises	2	e.	television programs about school subjects
2	b.	my teacher	3	f.	my classmates
2	c.	textbooks	2	g.	projects
2	d.	films	1	h.	audio tapes
			3	i.	workbooks and worksheets

9. Which components of the IST course(s) that you are taking do you like or not like? (If the child specifies a component of a particular course, put the letter of the course instead of an x on the line to indicate this: i.e., H=Alaska History, E=English, R=Reading, M=Math).

Components	Do not like	Like a little	Like very much
Computer exercises	0	1	7
Published texts	0	8	0
IST workbook materials	1	4	2
Outside readings	1	3	4
Audio tapes	2	2	4
Projects	3	2	3
Unit tests	2	5	0

For those highly liked or disliked, ask the student to explain their rating.

Instrument 6 STUDENT COURSE EVALUATION

Supervising Teacher:_____ Site:_____

Site Visitor:_____ Date:_____

Student:_____

This is to be administered to the child as an interview by the regional supervisor or supervising teacher.

Fill in response to item 1, then check the appropriate choice for items 2 through 9.

1. IST course(s) student is taking: ENGLISH (8 Students)

2. When I am doing my IST courses, I:

   2 a. almost always understand what needs to be done, and can work by myself.

   6 b. sometimes do not understand what needs to be done and need my teacher's help.

   0 c. usually do not know what to do and ask for the teacher's help.

   0 d. never can figure out what to do and wait for the teacher to show me.

3. When I am working on IST exercises:

   3 a. I finish the lesson and work at my own speed.

   2 b. I finish the lesson but have to hurry.

   0 c. I work at my own speed but usually do not finish the lesson.

   0 d. I usually hurry, but still do not always finish.

4. Computer exercises in the IST courses are:

   3 a. very interesting 0 d. not interesting

   4 b. somewhat interesting 0 e. not at all interesting, boring

   1 c. a little interesting

5. Audio tape programs in the IST courses are:

   1 a. very interesting 1 d. not interesting

   2 b. somewhat interesting 2 e. not at all interesting, boring

   2 c. a little interesting

6. Reading and written work in the IST courses are:

2	a.	very interesting	0	d.	not interesting
1	b.	somewhat interesting	1	e.	not at all interesting, boring
4	c.	a little interesting			

7. I think the IST courses that I do are:

0	a.	too easy	0	d.	a little too hard
2	b.	easy but not too easy	0	e.	very difficult
6	c.	just about right			

8. If I had my choice about how I would like to learn in school, I would prefer to learn from (check no more than 3):

8	a.	computer exercises	4	e.	television programs about school subjects
2	b.	my teacher	1	f.	my classmates
1	c.	textbooks	1	g.	projects
3	d.	films	1	h.	audio tapes
			1	i.	workbooks and worksheets

9. Which components of the IST course(s) that you are taking do you like or not like? (If the child specifies a component of a particular course, put the letter of the course instead of an x on the line to indicate this: i.e., H=Alaska History, E=English, R=Reading, M=Math).

Components	Do not like	Like a little	Like very much
Computer exercises	0	2	4
Published texts	0	3	2
IST workbook materials	1	2	3
Outside readings	0	3	2
Audio tapes	2	3	1
Projects	0	2	2
Unit tests	0	2	2

For those highly liked or disliked, ask the student to explain their rating.

Instrument 6 STUDENT COURSE EVALUATION

Supervising Teacher:_____ Site:_____

Site Visitor:_____ Date:_____

Student:_____

This is to be administered to the child as an interview by the regional supervisor or supervising teacher.

Fill in response to item 1, then check the appropriate choice for items 2 through 9.

1. IST course(s) student is taking: DEVELOPMENTAL READING (26 Students)

2. When I am doing my IST courses, I:

   14 a. almost always understand what needs to be done, and can work by myself.

   12 b. sometimes do not understand what needs to be done and need my teacher's help.

   0 c. usually do not know what to do and ask for the teacher's help.

   0 d. never can figure out what to do and wait for the teacher to show me.

3. When I am working on IST exercises:

   22 a. I finish the lesson and work at my own speed.

   1 b. I finish the lesson but have to hurry.

   1 c. I work at my own speed but usually do not finish the lesson.

   1 d. I usually hurry, but still do not always finish.

4. Computer exercises in the IST courses are:

   12 a. very interesting 0 d. not interesting

   12 b. somewhat interesting 0 e. not at all interesting, boring

   2 c. a little interesting

5. Audio tape programs in the IST courses are:

   5 a. very interesting 1 d. not interesting

   11 b. somewhat interesting 3 e. not at all interesting, boring

   6 c. a little interesting

6. Reading and written work in the IST courses are:

4	a.	very interesting	0	d.	not interesting
14	b.	somewhat interesting	1	e.	not at all interesting, boring
7	c.	a little interesting			

7. I think the IST courses that I do are:

0	a.	too easy	0	d.	a little too hard
2	b.	easy but not too easy	0	e.	very difficult
24	c.	just about right			

8. If I had my choice about how I would like to learn in school, I would prefer to learn from (check no more than 3):

17	a.	computer exercises	7	e.	television programs about school subjects
9	b.	my teacher	3	f.	my classmates
9	c.	textbooks	7	g.	projects
9	d.	films	3	h.	audio tapes
			12	i.	workbooks and worksheets

9. Which components of the IST course(s) that you are taking do you like or not like? (If the child specifies a component of a particular course, put the letter of the course instead of an x on the line to indicate this: i.e., H=Alaska History, E=English, R=Reading, M=Math).

Components	Do not like	Like a little	Like very much
Computer exercises	0	7	19
Published texts	1	20	4
IST workbook materials	1	17	7
Outside readings	1	4	8
Audio tapes	3	13	10
Projects	4	7	4
Unit tests	5	13	6

For those highly liked or disliked, ask the student to explain their rating.

Instrument 6 STUDENT COURSE EVALUATION

Supervising Teacher:_____ Site:_____

Site Visitor:_____ Date:_____

Student:_____

This is to be administered to the child as an interview by the regional supervisor or supervising teacher.

Fill in response to item 1, then check the appropriate choice for items 2 through 9.

1. IST course(s) student is taking: GENERAL MATH (24 Students)

2. When I am doing my IST courses, I:

   14 a. almost always understand what needs to be done, and can work by myself.

   10 b. sometimes do not understand what needs to be done and need my teacher's help.

   0 c. usually do not know what to do and ask for the teacher's help.

   0 d. never can figure out what to do and wait for the teacher to show me.

3. When I am working on IST exercises:

   20 a. I finish the lesson and work at my own speed.

   1 b. I finish the lesson but have to hurry.

   0 c. I work at my own speed but usually do not finish the lesson.

   1 d. I usually hurry, but still do not always finish.

4. Computer exercises in the IST courses are:

   8 a. very interesting 0 d. not interesting

   14 b. somewhat interesting 0 e. not at all interesting, boring

   2 c. a little interesting

5. Audio tape programs in the IST courses are:

   2 a. very interesting 1 d. not interesting

   7 b. somewhat interesting 7 e. not at all interesting, boring

   7 c. a little interesting

6. Reading and written work in the IST courses are:

4	a.	very interesting	1	d. not interesting
9	b.	somewhat interesting	1	e. not at all interesting, boring
8	c.	a little interesting		

7. I think the IST courses that I do are:

2	a.	too easy	2	d. a little too hard
6	b.	easy but not too easy	0	e. very difficult
14	c.	just about right		

8. If I had my choice about how I would like to learn in school, I would prefer to learn from (check no more than 3):

21	a.	computer exercises	4	e. television programs about school subjects
10	b.	my teacher	4	f. my classmates
8	c.	textbooks	5	g. projects
5	d.	films	2	h. audio tapes
			11	i. workbooks and worksheets

9. Which components of the IST course(s) that you are taking do you like or not like? (If the child specifies a component of a particular course, put the letter of the course instead of an x on the line to indicate this: i.e., H=Alaska History, E=English, R=Reading, M=Math).

Components	Do not like	Like a little	Like very much
Computer exercises	0	8	16
Published texts	3	16	4
IST workbook materials	4	13	5
Outside readings	2	1	2
Audio tapes	12	8	4
Projects	5	9	6
Unit tests	0	12	8

For those highly liked or disliked, ask the student to explain their rating.

Instrument 7 STUDENT INFORMATION

Supervising Teacher:_____ Site:_____

Site Visitor:_____ Date:_____

Student:_____ Grade:_____

This form should be filled in based on information provided by the teacher. It need not be in an interview necessarily. Use the most convenient method to obtain the information.

1. Date of birth:_____

2. Parent's occupation: Fathers: Primarily fishing; Mothers: primarily secretarial/clerk/aide positions.

3. Native group affiliation: Eskimo (22); Aleut (6); Tlingit (4); Athabascan (4); Non-native (2).

4. This child is (circle appropriate letter):
   a. Only child (3)
   b. Oldest of two or more siblings. (10)
   c. A middle child with two or more siblings. (23)
   d. Youngest of two or more siblings. (10)

5. Does this student qualify for special programs according to P.L. 94-142 or state laws?

   4 Yes 36 No

6. Number of days absent last year: 11.4 (range: 0 - 40)

7. Date student began IST program this year:_____

8. Student's major interests (list all if known):

School	Outside of School
a. Phys.Ed./Basketball	a. Socializing
b. Mathematics	b. Hunting
c. Reading	c. Skiing/Dog Mushing

9. Student's educational vocational goals in your opinion (check one or two):

12 Will probably remain in the village.

10 Will most likely go to college.

12 Will most likely seek work outside the village.

20 Will most likely obtain specialized training.

7 Will most likely obtain unskilled work.

6 Will most likely retain and use the traditional skills (hunting, fishing, trapping).

10. To the best of your knowledge, when this student takes a test, he/she appears:

6 Very worried and apprehensive.

25 Moderately worried and apprehensive.

16 Not at all worried or apprehensive.

11. Does this student exhibit increased effort when presented with new ideas or new information?

8 Yes, high effort

26 Yes, medium effort

12 No, low effort

1 No, never puts forth effort

12. When challenged or presented with new information, does this student persist?

10 Yes, if challenged will continue on task.

30 Sometimes, if challenged will continue working on task.

7 No, if challenged will probably not continue working on task.

13. Does this student require continuous monitoring and direction or does he/she work independently?

13 Yes, works well with minimal direction.

15 Yes, works will with moderate direction.

16 No, needs considerable monitoring and direction.

3 No, will not work in class unless continually monitored and directed.

14. Does this student usually abide by school or class rules?

11 Yes, always

27 Yes, usually

8 No, frequently does not abide by rules.

1 No, never

15. Does this student generally complete required work on time?

5	Yes, always	9	No, sometimes not
29	Yes, most of the time.	4	No, never or usually does not.

16. From what mode(s) of instruction does this student seem to prefer to learn? (Check one or more)

36	Computer assisted instruction	15	Textbooks
14	Teacher in lecture or discussion	9	Projects
23	Workbooks or worksheets	13	Classmates
18	Television and films	12	Audio tapes
0	Other (specify):		

17. Is this student able to use the Apple II Computer independently?

23	Yes, without direction	5	No, usually requires direction
19	Yes, with minimal direction	0	No, requires continuous direction

18. How would you rate your opinion of this student's academic ability?

3	Superior	16	Above Average	21	Average
6	Below Average	1	Considerably Below Average		

19. How are this student's study habits, in your opinion?

1	Superior	8	Above Average	17	Average
14	Below Average	7	Considerably Below Average		

20. Rank order the following six IST components. Assign a rank of 1 to the activity you think this student likes the most about IST and a rank of 6 to the lest liked activity.

4	Audio Tapes	6	Projects
3	Published textbooks	5	Outside readings
1	Computer exercises	2	IST workbook materials

Instrument 8 TEACHER'S OPINIONS ABOUT IST

Supervising Teacher:_____ Site:_____

Site Visitor:_____ Date:_____

Give this form directly to the teacher to fill out. It should take only 10 or 15 minutes.

Part I

1. In your own words, what do you see as the educational goals for your students?

_____

_____

2. Which of the following activities produces greatest interest in your students who are participating in IST? (Put 1 for the one that is the most interesting, 2 for the next, 3 for the least interesting.)

1	Computer exercises	2	Reading assignments
____	Textbooks	3	Supplementary activities
____	Projects	____	Audio tapes

3. Which of the following IST components do you think is most compatible with your style of teaching? (Put 1 for the most compatible, 2 for the next, 3 for the least interesting.)

1	Computer exercises	____	Reading assignments
2	Textbooks	____	Supplementary activities
____	Projects	3	Audio tapes

4. Do you often do things with students outside of class?

4	No, never	15	Yes, with many of my students
12	Yes, with a few students	4	Yes, with all of my students

5. In your teaching, what importance do you attach to the following: (Respond using the following scale: 1=very important, 2=moderately important, 3=not important.)

1.4	Expecting good performance from students.
1.4	Being understanding
1.9	Being friendly
1.9	Being strict

6. Mark an "x" next to the following classroom activities that work best with your students most of the time, and mark an "o" next to the ones that do not usually work well.

14x(21o) Lecture
29x(6o) Small group instruction
27x(4o) Instructional media
34x(2o) Individualized instruction
28x(6o) Learning by imitation

7. If your students are taking more than one IST course, indicate which of the four seem most acceptable to them with an "x" and least acceptable with an "o".

9x(1o) Alaska History
7x(8o) Reading
9x(2o) English
5x(11o) Mathematics

Part II

Teachers Views on IST courses

1. In terms of the amount of work for a teacher to prepare, train, coordinate, and keep records, IST is

__0__ too much work for a teacher to do.

__11__ more work than a traditional program.

__20__ less work than a traditional program.

__0__ not worth the bother.

2. In terms of the amount of training required to operate IST:

__0__ too much is required to operate IST.

__19__ reasonable but demanding amount of training is required.

__17__ the amount of training is easily accomplished.

__0__ the amount of training is so basic that it is not worthwhile.

3. If you were able to eliminate components from IST courses, indicate the order with which you would eliminate each of the following from the course(s) you are using (1=first to go, 2=next, and so on):

	English	Alaska History	Math	Reading
a) Computer exercises	6	6	5	6
b) Published texts	4	5	6	5
c) IST Workbook materials	5	4	4	4
d) Outside readings	3	3	2	1
e) Audio tapes	2	2	1	3
f) Computer supervisory tapes	1	1	3	2

4. In comparing IST courses to traditional courses (or what you used before IST was available), would you say that for the teacher:

0 IST courses are too much work.

24 IST courses are a reasonable amount of work.

11 IST courses are less work than what was available before IST.

5. Would you prefer to use parts of the IST courses rather than the whole thing?

14 Yes, I would most like to use (choose up to 3):

8 Audio tapes

6 Published material

1 Outside readings

14 IST workbook & exercise

14 Computerized instruction

1 Other (explain):_____

20 No, I would prefer to use the whole course in an integrated fashion.

6. Which portions of IST do you find your students have the most enthusiasm toward? (Check one or more)

10 Audio tapes

9 Published material

2 Outside readings

11 IST Workbook & exercise

34 Computer instruction

7. What kind of students are in IST in your district? (Check all that apply)

11 Students classified as educationally handicapped or eligible for special education.

10 Gifted students

10 Students with minimal English language skills.

28 Typical students in the district.

10 Others (explain):_____

8. How does your school give credit for completion of each IST course? (Place an x next to the appropriate response for each course being used in your school.)

English	History	Math	Reading	
2	2	3	1	When the student completes all lessons and units in a course, a year's credit is given.
2	2	2	2	When more than half of a course is completed, a year's credit is given.
1	0	1	0	Semester's credit for whole course.
2	3	4	4	The student earns fractions of a semester or year's credit for each unit completed.
2	2	5	2	We never addressed that problem.
0	0	1	2	No credit is given.
1	1	6	2	I don't know.
8	6	8	8	Other (explain):_____

9. How many weeks were you late in starting up? 6.5 (range: 0 - 23)

10. If there was a late start-up date in your school, what were the reasons? (Check as many as apply)

10 Ordering problems (explain):_____

13 Delivery problems (explain):_____

12 Malfunctioning equipment

6 Inadequate training for you to operate equipment.

9 Other (explain):_____

11. Which of the following were the most influential in getting the IST program going?

26 Your own initiative and perseverance.

11 The Regional Supervisor's assistance (explain):_____

_____

12 The support from the administrators in the district.

10 The teacher's guides and instructional materials.

10 Other (explain):_____

12. In terms of the way IST courses are put together and packaged, what would you say about the program?

25 It is well designed to be used and managed in a classroom like mine.

9 It should be changed as follows: _____

_____

_____

13. Did you volunteer to teach IST courses or were you assigned to do so by the school administration?

22 Volunteer

12 Assigned (but would have volunteered)

1 Assigned (would not have volunteered)